MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society

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VOLUME 24

JANUARY TO DECEMBER, 1941

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Volume 24 **JANUARY, 1941** **No. 1**

CAUSES OF BLINDNESS IN MINNESOTA*

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Minneapolis, Minnesota

THE factors responsible for blindness in the group applying for financial aid as needy blind have been studied to determine how much blindness is possibly preventable or remedial.

The examination of the applicants was done by those practicing ophthalmology in the various cities throughout the state. It is therefore through the coöperation of these physicians that these data have been secured.

Causes of blindness may be classified in several ways. Of most importance from the prevention of blindness viewpoint is an etiologic grouping of causes, while from a remedial aspect the descriptive or anatomic classification is of most value.

At the time this study was made there were 768 detailed records available. That number is now somewhat larger, but the percentages are affected very little. Only cases considered eligible for aid from a visual standpoint were included.

ETIOLOGIC FACTORS IN BLINDNESS

	Cases	Per Cent
Infectious diseases	241	31.3
Trauma	104	13.5
Toxic poisoning	3	.4
Neoplasms	16	2.0
Non-infectious systemic diseases	43	5.4
Congenital and hereditary origin	176	22.9
Etiology undetermined or not specified	185	24.
	768	100.

Each of the above groupings can be broken down as follows:

*From the State Bureau for Aid to the Blind and the Department of Ophthalmology, University of Minnesota. Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

Infectious Diseases

	Cases	Per Cent
Gonorrhea	2	
Measles	6	
Meningitis	10	
Ophthalmia neonatorum	37	4.7
Septicemia	1	
Focal sepsis, etc.	12	
Syphilis—prenatal	10	7.4*
Syphilis—acquired	47	
Syphilis—clinical diagnosis only	27	
Scarlet fever	1	
Trachoma	19	2.4
Ocular tuberculosis	11	
Other infections specified	13	
Infectious causes, type not specified	40	

*Syphilis (prenatal, acquired and clinical diagnosis only) as a group, form 10.9 per cent of cases.

*Trauma**

	Cases	Per Cent
Non-industrial injuries	56	7.3
Industrial injuries	48	6.2
Types of non-industrial accidents		
Injuries at play and sports	33	4.1
Household activities	4	
Street and traffic	3	
Birth injuries	2	
All others	14	

*See sympathetic ophthalmia—topographic classification.

Non-Infectious Systemic Diseases

	Cases	Per Cent
Anemia	1	
Diabetes	11	1.4
Nephritis	1	
Vascular diseases	8	
Central nervous system diseases	4	
Disorders of pregnancy and labor	9	1.2
Other systemic diseases—specified	5	
Other systemic diseases—not specified	4	

Congenital and Hereditary Factors

	Cases	Per Cent
Congenital	83	10.8
Known hereditary	43	5.8
Hereditary origin—presumed†	46	6.1
Consanguinity	1	
Not specified	3	

†Eye condition usually considered hereditary but for which, in these cases, the family history was negative.

Etiology Undetermined

	Cases	Per Cent
Unknown to science*	114	14.8
Undetermined by physician†	49	6.4
Not specified	22	2.8

*Includes (1) Senile cataracts which might be otherwise classified as due to age changes, etc.; (2) Glaucoma; (3) Cases of optic atrophy known to have been studied exhaustively.
†Includes largely those cases, long blind, seen by examiner years after causative factor existed. Topographical diagnoses such as phthisis bulbi, optic atrophy, etc.

DESCRIPTIVE OR ANATOMIC CLASSIFICATION

Causes of Blindness—Topographic Classification

	Cases	Per Cent
Eyeball	219	28.5
Cornea	86	11.0
Iris and ciliary body	76	9.8
Crystalline lens	83	10.8
Choroid and retina	126	16.4
Optic nerve	174	22.6
Vitreous body	2	
Miscellaneous and ill-defined	2	
	768	100.

This larger grouping can be broken down to the following:

Eyeball

	Cases	Per Cent
Glaucoma	76	9.8
Refractive errors, chiefly myopia	31	4.
Developmental anomalies	33	4.1
Albinism	6	
Anophthalmos	3	
Megalophthalmos	5	
Microphthalmos	4	
Aniridia	4	
Colobomata	1	
Others—specified	6	
Others—not specified	4	
Disorganized eyeball (phthisis, etc.)	76	9.8
All others	3	

Lesions of the Cornea

	Cases	Per Cent
Interstitial keratitis	9	1.1
Keratitis—type not specified	13	1.7
Ulcerative keratitis	35	4.3
Pannus	15	1.9
Other affections specified	13	1.7

Iris and Ciliary Body

	Cases	Per Cent
Iridocyclitis	38	4.9
Iritis	4	
Sympathetic ophthalmia	34	4.2

Crystalline Lens

	Cases	Per Cent
Cataract*	79	10.3
Ectopia lentis	4	

*Includes 35 cases of congenital cataract.

Choroid and Retina

	Cases	Per Cent
Choroiditis	4	
Retinitis	13	1.7
Chorioretinitis	33	4.1
Detached retina	19	2.4
Central vessel occlusion	2	
Retinal degeneration	54	7.0
Other affections—specified	1	

Optic Nerve

	Cases	Per Cent
Optic atrophy	160	20.7
Optic neuritis	4	
Neuroretinitis	8	1.
Other affections	2	

INFECTIOUS DISEASES AND BLINDNESS

241 Cases

Ophthalmia neonatorum 37, syphilis 84, and trachoma 19, total 140 cases or 58 per cent of the blind in this group. Theoretically this 58 per cent (18 per cent of all blind) is entirely preventable blindness.

Ophthalmia neonatorum is now much less a cause of blindness than the above figure would indicate. The majority of those blind from syphilis are adults, affected in the fourth and fifth decades. Early and adequate treatment of primary syphilis could materially reduce this number. The trachoma group are largely among our Indian population. The incidence of the disease (trachoma) is considerably greater than the number of blind from it would indicate.

Of the forty-eight blind from industrial injuries 73 per cent are in the 21-49 year group.

Of the thirty-four classified as blind from sympathetic ophthalmia following injury to one eye, twenty-eight fall in the non-industrial group and of these nineteen were injured at play or in sports. It is an established fact that the most effective treatment for sympathetic ophthalmia is prevention. This means prompt and adequate care of all eye injuries no matter how apparently trivial they may seem. While blindness from this cause is infrequent in comparison with the total number of eye injuries, it is possible to eliminate it entirely.

Neoplasms caused blindness in sixteen cases, fourteen due to intracranial tumors. The average duration of blindness for these fourteen is seven years; in all cases vision was lost before operation was performed; in seven cases with visual changes as initial symptom a proven diagnosis of pituitary tumor has been established. The duration of visual disturbances before diagnosis in five cases with adequate histories ranged from one to five years.

Glaucoma as a cause of blindness (seventy-six cases—9.8 per cent) is probably too low a figure due to the number of blind on old age relief. It is significant to note that the records show twenty-two cases neglected to seek adequate medical care, and that in practically all cases in which operations were done, these were performed so

TRAUMATIC FACTORS IN BLINDNESS

Non-industrial Injuries	Age at Onset of Blindness						
	0-1	2-9	10-14	15-20	21-49	50-64	Total
Play or sport	0	15	7	6	5	0	33
Household accidents	0	2	0	1	1	0	4
Street and traffic	0	0	1	1	1	0	3
Birth injuries	2	0	0	0	0	0	2
Others specified	0	0	2	4	6	1	13
Others—not specified	0	0	0	0	0	1	1
Totals	2	17	10	12	13	2	56

late in the disease that very little vision was saved. Both the public and the physician must become more aware of the early symptoms and signs of this disease before the number of blind from glaucoma can be materially reduced.

Cataracts as primary causes of blindness, aside from the thirty-five due to congenital and familial factors, were recorded in only forty-four cases. This low figure is in part due to the number on old age relief and in part to the excellent surgical care that has been rendered to these people throughout the state. The majority of the forty-four cases are inoperable due to complications. A few have had complications during or after operation or have retinal or optic nerve changes as well.

A review of the cases blind from complications of non-infectious systemic diseases illustrates very well the participation of the eye in systemic disease and the need for careful eye examinations by physicians in all types of disease. Prevention of blindness from these causes, anemia, diabetes, nephritis, vascular disease, etc., must come from careful control by the physician with intelligent coöperation by the patient.

After careful analysis of 768 cases of blindness as to cause, age of onset, and degree of visual acuity, and realizing that little or nothing can now be done to restore vision to these people, the thesis "prevention of blindness" comes home with considerable force. Possibilities in prevention are:

1. A parentage free from serious familial eye disorders.

2. In instances in which an offspring of apparently normal parents has a serious eye defect, present at birth—and commonly familial—limitation of the number of further offspring is indicated. The occurrence of from two to six siblings, blind at birth, as illustrated in this report, is inexcusable.

3. Routine Wassermann tests on *all* expectant mothers and prompt institution of anti-syphilitic therapy in all mothers with positive reactions will reduce the number of blind from "congenital syphilis."

4. Continued use of the "Crede" method for prevention of ophthalmia neonatorum is imperative. Ophthalmia neonatorum now means that either the drops were not used or were inadequately used.

5. Blindness from trauma could be materially reduced. Most of our industrial accidents occur among independent workers and farmers upon whom no safety rules are imposed. Neglect of minor injuries until serious complications arise causes a large percentage of the cases of monocular blindness in this group.

The non-industrially blind are largely the result of thoughtlessness and chance-taking acts of childhood and youth. Prompt care of all those so injured may prevent many cases of blindness.

6. Inflammations of the iris and ciliary body (iritis and iridocyclitis) may be due to a variety of causes. The number of blind from this cause could possibly be reduced by: (1) more prompt seeking of medical advice by the patient; and (2) earlier diagnosis and intensive therapy.

7. Glaucoma—prevention of blindness from this cause depends entirely upon *early* diagnosis and prompt institution of treatment plus a thorough understanding by the patient of the need for continuing under observation and therapy.

All measures intended for a betterment of the public health are, therefore, an integral part of a prevention of blindness program.

GLAUCOMA*

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THIS brief talk has been planned to help physicians who are not eye specialists in recognizing glaucoma. It is not meant for ophthalmologists.

Every year many patients lose vision more or less completely from glaucoma. In many the vision might have been retained had the condition been recognized in time and proper treatment instituted. In general, it may be said that vision lost through glaucoma cannot be regained. It can also be stated that when glaucoma is recognized, visual loss can usually be prevented.

Glaucoma is a symptom and not a disease. It is an obstruction and like some other obstructions is dangerous. The causes are many and variable, some known and more or less completely understood, while others are poorly understood, and some causes probably remain completely unknown.

At the risk of over-simplification, we shall consider glaucoma as due to obstruction of aqueous drainage at the filtration angle. There is much more to it than this, but such a theory is practical for our purpose, and we simply haven't time to go into other factors, such as rigidity of the sclera, swelling of the lens, congestion of vascular beds, abnormal chemistry, or over-production of the aqueous humor, and so on.

The physiology of the aqueous circulation is briefly and simply about as follows. The aqueous humor is produced in the region of the ciliary body. It circulates through the interior of the eye, bathing and nourishing the vitreous body and lens. It then passes forward through the pupil into the anterior chamber where it enters a convection eddy. It leaves the eye through the filter in the pectinate ligament, which is located just anterior to the root of the iris, passing into the canal of Schlemm and thence back into the venous circulation.

When the outflow of aqueous humor from the filtration angle is obstructed, it accumulates within the eye, and the intraocular pressure (spoken of as tension) rises. This might occur from fouling of the filter by floating particles. It might also occur if the root of the iris should make contact with the posterior surface of the cornea, and overlie the filter through any considerable part of the circumference, as sometimes happens. Both factors might act together to impede drainage of the aqueous humor.

Increasing the intraocular pressure materially above normal has several very serious effects. The weak spot in the eyeball, where the nerve head enters, gives way to a certain extent, and the nerve head becomes pushed back, forming the so-called glaucomatous cup. This, in turn, subjects the nerve fibers in the nerve head to abnormal pressure and to certain tensions. They apparently become stretched across the non-yielding edge of the scleral ring about the nerve head. This blocks certain fibers and bundles of fibers, and the resulting loss of function produces various types of geometric scotomata. These are called neuroscotomata. Another effect of the increased pressure is a reduction in blood supply to the retina. A large part of the retinal blood supply enters the eye through the ophthalmic artery at a normal systolic pressure, variously estimated at between 65 and 80 mm. of mercury. The normal intraocular pressure is in the neighborhood of 25 mm. Given a normal blood pressure of 70 and a normal intraocular pressure of 25, the effective pressure at which the blood enters the eye on the crest of the systolic wave would be 70-25 or 45 mm. Should the intraocular pressure increase to 50 and the blood pressure remain the same, then the effective pressure remaining for the nutrition of the retina would be reduced to 20 mm. at the crest of the systolic wave. Further, there is probably an interference with the return of tissue fluid into the venules. Whether reduced blood volume or interference with return circulation of tissue fluid is more important does not concern us now. The fact remains that the retina is deprived of sufficient nutrition, and function is interfered with or lost. The result in the visual field is concentric contraction and certain branching scotomata called angio-scotomata. You will recall that the retina embryologically is a portion of the

*Read before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

brain. Like the brain, when its cells or fibers are destroyed, they are not restored. When retinal nerve fibers and cells are destroyed through pressure or lack of nutrition, or both, they are not replaced, and their function is lost forever. Therefore, we say that, in general, vision lost through glaucoma is not recovered.

There are three types of glaucoma ordinarily recognized, namely, primary, secondary, and congenital. We shall confine ourselves to the primary.

Primary glaucoma is subdivided in classification into "congestive" and "non-congestive" or "simple." The congestive in turn is subdivided into acute and chronic. The non-congestive is always chonic.

Acute congestive glaucoma occurs in attacks of more or less violence. Before the patient suffers much there is usually an extended period of minimal prodromal attacks. These are characterized by redness, some discomfort, and temporary reduction in vision. Eventually there comes a real attack, when the patient suffers one of the severest pains known to man. This pain is in, about, or back of the eye and radiates through the entire side of the head. The eye is red, lacrimation is increased, every light has a halo about it, and vision is greatly reduced. If severe enough, nausea, vomiting, and chills may result. Sometimes precious time is lost, while other causes for these symptoms are sought. When the physician arrives, he finds: (1) marked scleral congestion; (2) lacrimation; (3) shallow anterior chamber; (4) a steamy or cloudy cornea which is anesthetic (if the intraocular pressure is high enough); (5) pupil in mid-dilation and reacting poorly; (6) increased intraocular pressure. The first five of these symptoms are more or less familiar to all of you and can be readily recognized. I know of no good reason why the last—intraocular pressure—could not also be more familiar. You all test surface cellulitis for fluctuation in search of accumulations of pus. The technic of testing ocular pressure is the same. If one can readily feel fluctuation in an eyeball, the pressure is probably normal. If the eye feels hard, and slides about like a marble under the lid, the pressure is high. If it is not hard, but on the other hand you cannot be sure of fluctuation, the pressure may be and probably is moderately elevated. Try it on your own eyeballs with both forefingers. In order to be sure that you are palpating the sclera and not the cornea, which is important, turn your eyes well downward.

The treatment of glaucoma is instillation of miotics, some drug or drugs which have the property of contracting the pupil, thus drawing the root of the iris out of the filtration angle as far as possible. A solution of 1 per cent pilocarpin nitrate (or hydrochloride) is a very good and practical preparation. It can be instilled every ten or fifteen minutes for several hours until the attack subsides. Operation for the purpose of producing an artificial drain or filter or for removal of a portion of the iris at the root may later be necessary.

Differentiation between iritis and congestive glaucoma is important. The former calls for atropin to dilate the pupil. To instill atropin in acute glaucoma is a fatal mistake. Some years ago I saw a patient with acute congestive glaucoma in whom a mistaken diagnosis of iritis had been made, and atropin had been instilled. When I arrived, the pupil was in extreme dilation and the patient in extreme pain. Fortunately, the retaina had not yet been destroyed, and the situation was saved by operation. The patient has a useful eye after twelve years, but the pupil still remains in complete dilation. The best points in differentiation lie in the iris. In glaucoma the iris looks almost normal, and the pupil is dilated; whereas in irititis the iris markings are blurred because of swelling, and the pupil tends to contract. In irititis congested vessels can often be seen in the iris itself, and adhesions may be found between the pupillary margin and the lens. If you cannot be sure of the diagnosis, it is better to instill hypertonic salt solution or Lewis's solution, or do nothing at all until consultation with an ophthalmologist may be had. Fortunately, when acute glaucoma is severe enough to seriously damage the retina, the patient is in such extreme pain that both patient and physician do something about it.

Chronic congestive glaucoma simply consists in a progression of the acute attacks to the point where the intraocular pressure doesn't return to normal between attacks. The attacks continue to recur with more or less severity.

Simple non-congestive glaucoma is much less severe than the congestive type but, because of its insidious onset and progress, may be much more dangerous from the standpoint of eventual

visual loss. It is about ten times as frequent as the inflammatory. You meet it much oftener in your practice and probably miss it usually. This is because it is so frequently entirely symptomless. One is almost at a loss in advising what steps should be taken by way of precaution.

Doubtless the ophthalmologist also misses some cases. He picks up many in routine refractions by palpating the eyeball or measuring the intraocular pressure. I dismissed a patient from the hospital just last week whose glaucoma had been found in the course of routine refraction. When he came in requesting refraction he had no suspicion that there was anything other than refractive error present. The tonometer revealed increased intraocular pressure in both eyes—left greater than right. When put on treatment with miotics, the right eye responded nicely, but the left eye tended to maintain an elevated pressure and loss of visual field continued progressively. The left eye was therefore operated upon.

Some times the ophthalmologist can only suspect the presence of glaucoma even after a complete examination with the special diagnostic methods in his office. He may then resort to certain provocative tests. Even with no symptoms and minimal signs, glaucoma may be well established already. It seems to me that many of these symptomless cases must inevitably continue to be missed by the family physician, even though he may see the patient from time to time for other things.

When symptoms begin, they consist of: (1) reduced vision; (2) scotomata; (3) reduced dark adaptation; (4) reduced color sense, but no redness or lacrimation. By the time the patient is aware of these symptoms, retinal damage may already be considerable. Such patients go seeking a pair of glasses. It is the responsibility of the examiner to discover the true nature of the difficulty. One of the most serious indictments of the indiscriminate fitting of glasses lies in the fact that glaucoma at this stage, when most of the vision can still be saved, is so frequently missed. Unless the refractionist is competent to recognize early glaucoma, it is inevitably and invariably missed. Later when it is so advanced that useful vision is already largely gone, it is often suspected for the first time that there is something other than refractive error affecting the eye.

If you examine the eyes of such a glaucoma patient who has minimal symptoms you will find that the pressure is elevated in both. Simple glaucoma is bilateral, although the pressure is usually greater in one eye. The anterior chamber is shallow. The pupil is normal or dilated. Fundus examination reveals a glaucomatous cup in the nerve head. You may be able to tell that the visual field is contracted by rough tests even without a perimeter.

By special tests the ophthalmologist finds in addition: (1) free pigment in the anterior chamber; (2) adhesions in the filtration angle between the iris and the posterior corneal surface; (3) atrophy of the iris; (4) atrophy about the disc in the fundus; (5) on the perimeter, visual field alterations both as to form and color, and scotomata.

The treatment again is pilocarpin, eserine, or some other miotic. If this controls the pressure well, and if the patient can be depended upon to use the drops, no operation is necessary.

The patient must realize, however, that his eyes must be treated for the rest of his life. Some patients begin in all seriousness but some times become careless and neglectful. To illustrate. A 60-year-old carpenter from a nearby city came in on account of reduced vision in the right eye. That was in 1925. A study revealed simple glaucoma that could be fairly well, but not completely, controlled with miotics. Operation was advised, but he refused, so he was carefully instructed in care of the eye, and dosage was carefully adjusted for him. He continued treatment for a while but after a time became careless, did not return for check-ups, but instead had several changes of glasses. Seven years later he returned with pain and redness in the right eye, which had, meanwhile, become entirely blind. The pressure was found to be about 80. The left eye was also definitely glaucomatous, but this time the patient consented to operation, and the second eye was saved.

In a short discussion of this nature it is not possible to say a great deal about glaucoma, but it is hoped that after this little review you may suspect the trouble more often and help to save the vision of these patients who mistakenly assume that they only need a change of glasses. If any of your patients over thirty-five years of age complain of reduced vision or blind spots, keep these few things in mind: Glaucoma oc-

curs in the latter half of life, and untreated glaucoma leads to irreparable blindness, usually with no pain and with but few symptoms. Don't tell your patient that this reduced vision is due to age. Visual acuity remains unaltered to advanced age unless pathological conditions arise within the eye. Don't tell him that it is due to cataract and that he may postpone treatment until his vision is reduced to counting fingers even though he may have signs of cataract. Most glaucoma patients also have cataracts. Don't send him out to change his glasses merely, but insist upon a competent and thorough examination. If you can recognize, or even suspect, glaucoma, you will have rendered your patient an inestimable service. For him, it may mean the difference between vision and blindness.

SENILE CATARACT*

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Minneapolis, Minnesota

WHEN a person is told that there is a cataract developing in one or both eyes, he often throws up his hands in horror. How often some member of the family, or even the family physician, when an elderly person comes for an eye examination, warns the ophthalmologist not to tell the patient there is a cataract, if one is present. "Anything else but that," they say. If the truth were known, "anything else but" is a much more serious condition than uncomplicated cataract formation.

One should be very sure, in the first place, that any progressive loss of vision in an elderly person is due to lens changes. We see people who haev been told that they had cataracts and must wait until they are "ripe." When they come for operation, they are almost or entirely blind, not from cataracts, but from a chronic simple glaucoma. Other serious lesions are those in the retina, circulatory changes, senile macula degeneration, arteriosclerosis and hypertension. Patients with cataracts, and the public generally, should be told that cataracts are not the most serious eye condition they can have, but belong at the other end of the scale, among the less serious. Almost all uncomplicated cataracts can be removed with relatively little discomfort to the patient and with resulting good vision.

Senile cataract is a name given to the change which occurs in the crystalline lens producing a hard and, eventually, opaque lens. It results from repeated insult to the lens structure by chemical, mechanical, thermal, photogenic, or nutritional factors. It is not merely a degenerative change taking place with increasing years, but a real pathological condition. While the greatest number of cases occur in patients who are around seventy years of age the same condition obtains in patients in the forties or even earlier.

A good deal of work has been done, much in the past decade, on the chemistry of the lens, and the experimental production of cataract. From this we know of chemical changes which take place in normal lens as compared with cataractous lenses, particularly an increase in cholesterin and in sodium and calcium salts, especially the phosphates, and a decrease in potassium. We see the changes which occur in lenses of diabetic patients, causing changes in refraction, and, in some, a rapid development of opacity, true diabetic cataract. In others we have a more slowly developing cataract, in every respect like the so-called senile cataract, which should probably be called senile cataract in a diabetic patient rather than diabetic cataract.

The lens has no blood supply, and its nutrition must be maintained by osmosis from the intra-ocular fluids which surround it. The capsule of the lens acts as a semipermeable membrane, allowing passage of nutriment into the lens and the discharge from the lens of the products of its metabolism. Any interference with this process causes the lens fibers to become opaque. Such a marked change in the balance of osmotic pressure takes place in diabetes, resulting in swelling and opacity in the lens.

Experimental work on lenses has shown that ultra-violet rays from the quartz mercury vapor arc, ordinary sunlight to a lesser extent, and

*Read at the annual meeting of the Minnesota State Medical Association, Rochester, April 24, 1940.

infra-red rays slightly, ionize lens material making the phosphate ions electronegative. By uniting with positively charged calcium ions in the lens, insoluble calcium phosphate is formed.

Other experimental work has shown that cataracts can be produced in animals by feeding lactose, and even more rapidly with galactose. It has been shown further that if vitamin C, and more especially, if cystine is added to the diet in these rabbits that there is an appreciable delay in the cataract formation. Galactose causes a diminution of the sulf-hydryls (glutathione and cystein) necessary to the oxidative and reducing process in the lens. The addition of yeast, rich in glutathione, of cystine alone, or of vitamin C, definitely stayed the process of opacification of endocrine dysfunction is well known.

We know that cataracts can develop from electric shock, from irradiation with x-ray and radium, in glass blowers, and more frequently in tropical countries where there are more ultraviolet rays in sunlight than in more temperate regions. The possibility of cataract development on an allergic basis, as seen in cases of more or less generalized eczema also should be mentioned. Cataract formation in various types of endocrine dysfunction is well known.

All this experimental and clinical evidence shows the effect on the lens capsule and on the lens substance. It seems very likely that the ordinary senile cataract is a cumulative result of one or of a combination of factors in the daily life of individuals whose lenses are subjected to repeated insults.

From this it can be seen that there may be a wide range in the age period when cataracts develop, and in the rate of progress of lens changes. The younger the patient and the slower the development, the more difficult is the handling of the case.

Up to the present time the medical treatment of cataract has been very disappointing. Many substances have been used such as drops, powders for insufflation, subconjunctival injections and internal medication. I do not believe I have ever seen a case in which I could be sure that the development of cataract was arrested by medical treatment, although various observers have reported arrested development and even clearing of opacities. I do know that it has been, unfortunately, a lucrative field for charlatans.

This does not mean that one should not treat the patient in whom cataracts are developing. The general health should be looked after, particularly hygienic and dietary factors. Dionin solutions may be used as drops instilled into the conjunctival sac. In the incipient and immature stages in those cases where the opacity is mostly central the pupil can be dilated during the daytime with a weak homatropine solution, allowing for some vision with the clearer peripheral portion. If this is done, the tension of the eye must be watched.

While the vitamins C and G (B) have been shown to have an influence in the formation of experimental cataracts, their use in treatment up to the present time has shown no definite results. They may be tried, however, especially in the very early stages of lens change, with some hope of influencing the morbid process. As the work in this field is continued, there is reason to hope that we will have a helpful agent in the combating of senile cataract, at least when seen in its early stages.

The most important consideration in the treatment of patients with senile cataract has always been surgery. Judgment as to time of operation must be exercised. If one eye remains useful, the more involved eye should not be operated in an immature state. If both progress about equally and the patient is incapacitated one cataract should be removed. If one eye goes over to hypermaturity while the other is still useful, the lens should be removed, depending on the age and condition of the patient. There are too many factors involved in this problem to permit further consideration in the short time we have.

In the pre-operative care of the patient, the general health should be built up as well as possible. Foci of infection, especially teeth, should be eradicated. While some surgeons feel that there is little danger from such foci when they have been present for some time I have a healthy respect for the damage that may be done by postoperative endogenous infection. I still believe the possibility of trouble is greater from these, than from infection in the conjunctival sac. The latter, however, should be cleaned up. An infected lacrymal sac should be removed. If the patient is a diabetic, the sugar should be reduced to a minimum.

As to the surgery itself little need be said. I believe that for the most part, the classic operation with removal of the lens from the capsule

is safer than the intracapular operation, if the surgeon does not do a great many operations. Arnold Knapp reported that vitreous loss was definitely greater in 500 intracapsular operations than in those receiving extracapsular extraction. His comment is as follows:

"The complication of the intracapsular operation which may be traced to the operative technic is a severe and definite form of iridocyclitis due to traction on the ciliary body. The greater number of cases of loss of vitreous with its complications can be reduced by better anesthesia and greater experience. Glaucoma is much less frequent than with the extracapsular operation. The question of the relative frequency of detachment of the retina is open. The dire late consequences after the intracapsular operation which have been repeatedly brought forward by some writers cannot be substantiated by facts."

Summary

1. Senile cataract is a disease of the crystalline lens and not merely a degenerative process of old age.

2. Medical treatment of this disease of the crystalline lens has been disappointing.

3. Experimental work on cataract formation is giving us hope of more satisfactory treatment of this common eye condition.

4. Cataract surgery, in otherwise uncomplicated eyes, is successful in most instances, and patients should not be left to live in dread of blindness or fear of operation.

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SQUINT IN RELATION TO LOSS OF VISION*

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CENTRAL or macular vision begins to develop at the end of the second post-natal month and such development continues until the end of the sixth or seventh year. Vision is established after this age. The occurrence of squint before the normal and complete establishment of vision is accompanied by amblyopia or loss of vision in the squinting eye if the squint is monocular. Since amblyopia, or loss of vision, is common in convergent and rare in divergent squint, the discussion of amblyopia is almost entirely concerned with convergent squint. Likewise the main characteristics of convergent squint are amblyopia and poor fusion, fusion being the ability to get a single cerebral impression when objects fall on corresponding portions of the retina. These factors are only rarely present in divergent squint.

Amblyopia in squint is directly proportional to the age at which the squint occurs—the younger the individual the more rapid the loss and the more profound the amblyopia. Children who squint in the first or second year lose all vision in a month or two and children of six or seven years lose little or none. The cause of the amblyopia is a central scotoma or blind spot of approximately ten degrees corresponding in size to the papilo-macula bundle of the optic nerve. Toxic amblyopia, due to alcohol, tobacco, quinine, lack of vitamin B and multiple sclerosis have some of the same clinical characteristics as amblyopia of squint.

In addition to the central scotoma, contraction of the visual field is also present. Congenital amblyopia, or congenital failure of the central vision to develop, may occur with or without the presence of squint. Such cases, however, do not

*Read before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

show shrinking of the peripheral fields when not associated with squint. It is not to be inferred, however, that the congenital amblyopia is the cause of squint for in the majority of instances the amblyopia is not the cause but the result of the squint. In the two case histories which follow, both children had a definite congenital amblyopia, although squint never occurred in either case. Other factors beside amblyopia itself are necessary for the production of squint.

Case 1.—B. C., aged six, complained of no symptoms, but his parents were advised to have his eyes examined by his school teacher.

Examination revealed the following—Vision: Right, 20/20; Left 10/200. Retinoscopy: Right + 350S + 50 × 90 = 20/20; Left + 600S + 125 × 100 = 8/100. Muscle balance: There was no deviation either for distant or near vision. Treatment consisted of constant occlusion for nine months. There was no improvement in vision.

Case 2.—F. K., aged 7, was brought for examination because the family thought his eyes were weak. He had had smallpox and impetigo when ten days old and one eye was slightly red at that time. Vision: Right, 10/100; Left, 20/20. Muscle balance: Eyes showed no deviation on screen test and have never crossed. Retinoscopy: Right + 50S; Left + 25S + 25 × 90.

The cause of the central scotoma is entirely theoretical as no opportunity has ever been presented for microscopic study. Many feel that the amblyopia is dependent upon some defect in the optic nerve itself. Professor Tscherning expressed this belief to me personally some years ago and was of the belief that some anatomical change would be found if one were fortunate enough to secure such a specimen for microscopic examination. He believed, also, that the improvement in vision was entirely a matter of education. Others compare the loss of vision to the inability of deaf mutes to talk. If hearing is lost before four years of age the child will certainly be mute. If hearing is lost after four years and before seven, mutism will probably be present and if after seven years the child will talk even though he is not able to hear.

My personal feeling on the subject is that amblyopia is most often a functional disturbance or a mental adjustment of the individual in order to prevent diplopia. It is surprising that when the two eyes have equality of vision that alternating rather than monocular squint occurs and suppression of the image, or central scotoma is present only in the deviating eye. When the deviating eye fixes, the central scotoma disappears spontaneously. This type of central scotoma can also be demonstrated in individuals who are using a monocular microscope in which both eyes remain open but only one eye fixes, or in many individuals who use one eye for reading; consequently reading has a tendency to be more of a monocular than a binocular effort.

It is also important to remember that in alternating squint where one eye changes more rapidly than the other the squint may become monocular and amblyopia result. Then, too, the functional nature of amblyopia can definitely be demonstrated by the recovery of normal vision after occlusion of the fixing eye or by the complete loss of vision in an occluded eye which was previously normal. The following history represents such a case:

Case 3.—J. W. The eyes of this patient began to turn shortly after birth. On first examination at two years he had a 25 degree convergent squint in the right eye and a marked amblyopia. The left eye was immediately occluded and such occlusion was continued for one and one-half years. No examination had been made for one year, and when seen at this time the vision in the right eye was normal and the left eye practically nil. At four years of age, occlusion was changed to the right eye but it was never possible to improve the vision in the left eye, which had been occluded for a long period of time, without an examination. The vision in the right eye has remained normal and the vision in the left eye 4/200 and not improved. Surgical correction was necessary to correct the cosmetic defect.

Much speculation has occurred concerning the age at which vision may be recovered when the loss is due to amblyopia. It is generally considered that little vision is regained after the seventh year although there are many cases reported which indicate that such recovery may take place at a later age. It is important, however, to remember that some individuals do not have a definite scotoma but the vision is held in abeyance only because of a high refractive error which improves readily a few months after correction of the error has been made. When true amblyopia exists with a definite central scotoma, the vision which is regained after ten or eleven years of age is entirely inadequate for the individual to carry on many of the useful pursuits of life. Such is represented by the history given in Case 4.

Case 4.—M. M. developed convergent strabismus at three years and when first seen had a convergent strabismus of the right eye and a marked amblyopia. At eleven years of age she developed a choroidal tubercle in the left macula area with relapses in the next five years until the vision of the left eye became 20/200. Original vision of 20/200 in the right, or amblyopic eye, which had been used for the past nine years, has been checked at frequent intervals since that time and has never improved beyond 20/50, while the left eye remained at approximately 10/200 without central fixation due to the macular lesion.

There are far too many cases of amblyopia in every community and much of the fault rests entirely with the medical profession. Advising parents to wait until school age, when squint occurs at two or three years of age, is as false as postponing treatment in any acute disease. Such advice must, however, have arisen with the profession itself.

That amblyopia can be relieved in some, if not in all cases, is shown by the following case histories along with approved methods of treatment:

Case 5.—J. J. developed convergent strabismus at nineteen months and had had part time occlusion up to five years of age at which time the vision was: Right, 20/20; Left, 20/50. Total occlusion was, a this time, instituted and continued for six months when the vision became 20/20 in each eye. Orthoptic training was then instituted and a fair degree of fusion developed but with a deviation of approximately 15 degrees for distance and 30 degrees for near. Surgical correction should, at this time, have been instituted, yet, in spite of the deviation, the vision has remained normal for the last year and a half and should, at this time, be well established.

Case 6.—J. E. S. had had a convergent strabismus practically since birth with reduced vision in the left eye treated by occlusion and orthoptic training. Treatment was first instituted at three years, was continued for the next two years at which time the vision became normal in either eye with a deviation of approximately 15-20 degrees convergent strabismus and constant fixation of the right eye. At this time recession of the left internal rectus and resection of the left external rectus and continued orthoptic treatments produced binocular fixation and normal vision. It is doubtful if the fixation could have been maintained without surgical correction because of the marked contraction of the left external rectus.

There are several factors which should be stressed. Occlusion when used should be total. Part time occlusion is of little value. Frequent examinations to determine the vision of both eyes is imperative. When normal vision has been acquired, yet fixation does not occur spontaneously, such lack of fixation may be due to muscular contraction of the internal rectus. It requires more nervous energy to fix with a squinting than a non-squinting eye due to structural changes in the muscles. Consequently, surgical correction of the anatomical changes are necessary to help maintain fixation.

The operation of recession or retroplacement of a contracted muscle and subsequent resuturing of this muscle to the eyeball and the routine use of intratracheal general anesthesia have greatly improved operative results.

CONTRAINDICATIONS TO ESTROGEN THERAPY

Malignant growths of the mammary gland and the uterus have been induced in rodents with estrogens by numerous investigators. Some physicians, however, have doubted that the therapeutic administration of estrogens in the human being could result in the development of similar malignant growths. It has been pointed out that, theoretically, tremendous dosages of estrogens might be required to induce human cancer, when calculated according to body weight. No doubt estrogens have been used intensively for relatively too short a time to warrant the conclusion that mere absence of reports from the literature justified a disregard for the possible consequences of estrogenic therapy. Recently two significant reports have appeared which should indicate the possible dangers of administration of estrogens; one reports a case of mammary cancer following prolonged use of estrogens, and the other reports the appearance of carcinoma of the cervix in three patients among forty-three who were treated with estrogens for kraurosis vulvæ and senile vaginitis. The Council on Pharmacy and Chemistry and THE JOURNAL have repeatedly warned against the indiscriminate and prolonged use of estrogens and have emphasized the possible occurrence of mammary carcinoma in patients who are susceptible to the development of such malignant growths. It would be unwise to consider that there is safety in using small doses of estrogens, since it is quite possible that the same harm may be obtained through the use of small doses of estrogen if they are maintained over a long period. While there appears little or no evidence to indicate that normal women may develop such malignant growths, it would be well for the physician to realize that this is by no means an impossibility in patients who have a personal or familial history of genital or mammary cancer. It has been reported that the new synthetic estrogen diethylstilbestrol is far more active than the natural estrone and estradiol in the production of uterine and extra-uterine fibroids in guinea pigs. There is no evidence, however, that it is more carcinogenic than these substances. (Jour. A.M.A., April 20, 1940, p. 1560.)

THE COMMON BEHAVIOR PROBLEMS ENCOUNTERED IN THE PRE-SCHOOL PERIOD*

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CHILD psychiatry is a recent development in the sphere of medical sciences. It came into being with the professed goal of attempting to prevent the high incidence of mental deviation encountered in the adult years. It is generally accepted that the onset of mental disease is seldom sudden, but is a gradual accumulation of maladjustment that can frequently be traced back into early childhood.

The problems of the pre-school age are important, for during these brief years the fundamental patterns of meeting life's situations are laid down. As our understanding of psychiatric problems broadens, this period acquires greater significance. If we are to be successful in the campaign of prevention of mental disorders, it cannot be overlooked.

Until recently, illness in children was regarded as part of general medicine. The same procedures that were followed with adults were considered appropriate in modified form for the child. It is a short half-century since the branch of pediatrics became a separate entity. Its early years were devoted to the evolution of scientific infant feeding, the management of the acute infections and the care of the chronically ill. Modern methods, the advances made in bacteriology, more accurate means of diagnosis and effective specific treatment aids have entirely altered the type of problem that confronts the pediatrist of today. There is now time for him to direct attention to the consideration of each patient as an individual and to evaluate his needs. The recent report of the American Board of Pediatrics, published in the *American Journal of Pediatrics* of February, 1940, outlines a course of study in child psychiatry the Board feels would be of practical benefit to pediatricians. This is concrete evidence of the recognition of the importance of emotional problems in the sick child.

Child psychiatry is a more recent development than pediatrics. In America, the first children's clinic was established in Chicago in 1909 by Dr. William Healy, the present director of the Judge Baker Guidance Center in Boston. From this early Chicago clinic great things have grown. Our guest speaker this afternoon, Dr. Paul Schroeder, the present director of the Institute for Juvenile Research, today carries on the work of the original clinic established by Dr. Healy. The credit for much of this development belongs to the Commonwealth Fund and the National Committee for Mental Hygiene, which so generously jointly sponsored the demonstration child guidance clinics. The Rockefeller Foundation also has given financial support to this activity. This type of service is past the experimental stage. From the single clinic in 1909 and the half dozen of 1920 there are today approximately 500 child guidance clinics spread across this country.

Until recently there was but a fragile bond of interest between the pediatrist and the psychiatrist interested in children. Each felt that the other's territory held little interest for him. Few understood the jargon of the other, as each attempted to separate the child into his physical and mental sections. The pediatrist recognized that the child had a mind, but thought it was of little importance in his treatment plan. Often a blank wall of resistance was raised by the pediatrist toward the psychiatrist. On several occasions in my early days in this work I was invited to speak at pediatrics meetings and found many of the pediatrists departed before I started. They felt that a psychiatrist was bound to confine his remarks solely to sex conflicts in infants and were not interested. Usually the same few friends stayed to listen because they had found, several of them through the medium of their own children, that perhaps some useful comments might be offered.

The reception at the psychiatric meetings was not much more cordial than that received from the pediatrists. Ten years ago, at the American Psychiatric Meeting in Toronto, I was invited to read a paper entitled "Psychiatry in the Pe-

*Presented before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

diatric Department of a General Hospital." This study was based on four years' work at the Strong Memorial Hospital at Rochester, New York, where Dr. McQuarrie, the present professor of pediatrics at the University of Minnesota, and myself both were on the staff and had worked in close coöperation on our common problems. The psychiatrists interested in child guidance at that Toronto meeting neatly dissected the paper, in which was made the premature statement that " the psychiatrist had temporarily assumed the sponsorship of work with children for the pediatrician with the aim of ultimately returning it to him." The attitude was that the two fields were and should be strictly delineated. I disagreed with the point of view, for it was felt that this was the weak spot in the development. I continued with my plan of coöperation and am pleased to see a gradual capitulation of both pediatrists and psychiatrists.

Our work at the Psychiatric Clinic for Children at the University Hospital and earlier in the clinic at the University of Rochester has indicated the necessity for a close bond between these two fields of children's work. It should be fully recognized that the psychiatrist has no desire to supplant the pediatrician, but strives to complement him. The latter, however, should be trained to be alert for the emotional components that occur in sick children. Once he has become aware of their presence he can plan a course of action toward their elimination. He will find that the majority, if recognized early and managed sympathetically, will disappear. This is the truly preventive work of mental hygiene.

Where the problem is already well established and the environmental factors so formidable that treatment procedure is complicated and time-consuming, it becomes impractical for the pediatrist to attempt to carry it out. Reference to the psychiatrist is then indicated. The special facilities of the child guidance clinic can be marshalled effectively to deal with complicated situations. Here each problem is approached from the angles of physical health, intellectual and emotional endowment and environment. In a high percentage of problems referred to us for study, not only in the pre-school group but also in older children, the difficulty originates with the adults who surround the child rather than with the child himself.

Those of pre-school age coming to the hospital psychiatric clinic present predominantly physical problems that have led to reference for study. The most common problems of this group center about feeding difficulties. Probably the clearest picture of them can be given by briefly presenting a few typical cases.

Case 1.—J. C., aged twenty months, was referred to hospital by the family physician with a history of regurgitation of ten months' duration and a tentative diagnosis of pyloric stenosis. Every approach had been tried by the family physician without success. Various modifications of diets had been attempted, and at the time of reference the child was on twelve hourly feedings per day. These she regurgitated regularly. When making the hospital arrangements over long-distance phone, the family physician outlined the history and added, "The parents are a pair of old maids. The father is as bad as the mother. They never should have had a child. They will run you ragged." Obviously the physician displayed a strong emotional reaction against them.

J. was a bright, well-nourished child in spite of her history of regurgitation. Complete physical study revealed no pathology except an exceptionally irritable gastro-intestinal tract that would indulge in active retro-peristalsis with minimal stimulation. J.'s most expressive remark was, "I'm going to be sick," after which she usually was.

J. was the only child of parents in their late forties. They had been engaged twelve years before marriage. The father, a prosperous village business man, had been dominated all his life by his mother, who disapproved of his contemplated marriage. He was neurotic and a patent medicine addict for many vague complaints. He felt guilty that his poor health was responsible for the misfortunes of his child. The mother, who throughout the long engagement had taught school, was an intelligent, but frustrated, woman. She had equal guilt fears that the long delay in pregnancy, coming near the menopause, was responsible for the difficulty. Both parents knew that this would be their only child. Consequently they were apprehensive over her survival. The mother had given her undivided attention since birth, and the preceding year during the child's illness had not left her for a moment. It was only fear in both parents that had induced them to bring her to the hospital. The mother sought admission for herself so that she could be near the child.

In the hospital the child was whiny and expected to be the center of attention. She was early placed on a regular diet suited to her needs. If she lost a meal, nothing was forthcoming until the next meal. At first she resented the other children as she had never been close to others before. Later she became interested. After ten days in the hospital she was brought into the nursery school group for play periods. Her first reaction was to demand every toy from other children, going from one to another. When refused her reac-

tion was, "Give it to me. I'm going to be sick." One three-year-old boy refused to give in and upon J.'s threat of illness called to the rest of the group to watch J. be sick. When requested thus to demonstrate, J.'s ability for once failed. This incident marked the beginning of a new era of constructive education. Contact with children accomplished what adults had failed to do. The regurgitation had no more serious basis than a pair of over-solicitous parents and a poorly directed medical program that ignored emotional tension in both parents and child. Our treatment capitalized the reassurance of the parents, the removal of many of their frustrations, demonstrating to them that their child could be a normal youngster. The outcome was good as the parents both developed understanding and outside interests that gave them other things to think about.

Case 2. A second variety of feeding disturbance is represented by R. L., a three-year-old daughter of a physician. The mother before marriage had been a graduate nurse. R. from an early age had many allergic reactions such as to milk, wheat flour and many of the common foodstuffs. In addition, infections increased her anaphylaxis. She twice had pneumonia in addition to double mastoidectomy. She was frail, underweight and high strung, and being intelligent had learned to dominate the family by refusal to eat. Both parents were aware of the narrow margin of safety and became unduly apprehensive when she refused food. Mealtime became a daily battleground of coaxing, wheedling, and promising. The parents realized their approach was wrong, but admitted that she had them beaten. They asked that she be admitted for study and training. R. was an old friend in hospital, where she had often been during serious illnesses. This time she was ambulatory and after preliminary study came to nursery school each day from the hospital ward. The first meal she was placed with other children, under the existing rule that none could leave the table till all had finished. R. toyed with her food while the others waited. The span of patience of three-year-olds is short. Restlessness grew intense. Finally a boy said, "Tomorrow you put R. at another table. We don't want her with us. She is too slow and spoils our fun. We want time to play." This was her first encounter with disapproval. Coming from a contemporary it carried weight. The next day no one wanted her at their table because of her slowness. She made some effort to coöperate and finished a small serving in acceptable time. Each day her plate was filled a little fuller until she was consuming an adequate amount. For weeks after discharge to her home from the hospital she got along on one full meal a day. She would eat heartily in nursery school, but usually refused breakfast and supper. As the parents acquired reassurance, they began to ignore her and made little effort to persuade her to eat. On one occasion they suggested that as R. probably could not eat all her portion, she might share it with her brother. R. left none to be shared. As casualness and a sense of security grew in the parents, R.'s efforts to dominate decreased. It was encouraging that with the diminution of tension there was an accompanying lowering of allergic response.

Feeding problems frequently originate after serious illness, but persist long after the convalescence has ended. The mechanism of production is easy to understand, but the reason for perpetuation is not always so apparent. The explanation can usually be found in parental attitude toward food. Over-emphasis defeats the purpose if the child learns he can gain attention by refusal to eat.

The elimination of a feeding problem is important. It may be the starting point of a gastrointestinal neurosis, so common in adult years, that has progressively passed through the stages of food fads and idiosyncrasies to more exaggerated manifestations.

Once the physician has completely ruled out the possibility of an organic basis for refusal of food the task is only partially complete. The reeducation of parental attitudes is equally important. The frequency with which these children reach the clinic indicates that the correction of a feeding problem is not always easy. Reeducation is often time-consuming. Occasionally it becomes a formidable task, involving the reorganization of many fundamental principles in the lives of both parents that exert unfavorable influence on the offspring. It is time well spent, for the persistence of these traits will produce undesirable reactions in different forms at a later date.

Temper tantrums and fears rank second and third in order of incidence of referral to the clinic. We suspect that in actual occurrence these are more frequent than the feeding problems. They do not reach the clinic because they do not represent a comparable threat to survival. The parent expects that it is a transitory inconvenient phase that will be outgrown. Like the feeding problems, the persistence of these reactions should be cause for concern, for when they are perpetuated into the adolescent and adult life, they often become major handicaps to success. Again it is essential that the physical status of the child be thoroughly investigated. In the absence of pathology, attention should be directed toward an investigation of the system of management. It is easy for these patterns to become established in a child below normal physically.

The threshold of fatigue and sensitivity is lowered, tension is increased, impressibility is heightened and misbehavior results.

In a child who is well the incidence of tantrums and fear become symptoms of ineffectual management. The busy practitioner is prone to consider the treatment of tantrums and fears beneath his dignity, beyond the superficial suggestions of isolation and ignoring the tantrum or reassurance in the case of fear. The true explanation often lies much deeper and must be considered if sound foundation for satisfactory future development is to be laid. Malignant parental attitudes toward the child may first attract attention through outbursts of temper in the child. Parental rejection may influence the system of training, against which, as a result of frustration, the child expresses himself explosively. Careful analysis of the situation that eliminates the source of friction may prevent more serious developments at a later period. Veiled antagonism by a parent toward his child may produce many other types of reaction besides tantrums and fears. We have seen many children whose response was: (1) wilful destructiveness; (2) aggression toward other children; (3) neurotic punishing reactions such as thumb sucking, facial tics and habit spasms, reversion to enuresis and soiling after satisfactory toilet habits have been established; (4) refusal to talk or reversion to baby talk. Reactions of this type may exist as single entities or in multiples. Little success can be expected from treatment if the emphasis is directed solely toward the child. Correction of the faulty parental attitude toward the child is essential if any permanent change is to be expected.

A typical response is demonstrated in the following case:

Mary L., four and a half years old, an only child, was referred for study by the family physician because of poor muscular coördination, lethargy, and flabbiness of muscles. The local doctor could find no evidence of organic disease but feared the onset of a progressive muscular dystrophy. Careful physical study revealed no definite reason for the condition although coördination was poor, she frequently tumbled, and all her movements were clumsy. Birth and health history were essentially normal.

The family background was important in that the parents had separated soon after Mary's birth. The father was an intelligent, but thoroughly impractical individual, with little sense of responsibility. After the separation he had drifted out of the picture. He made one feeble effort at reconciliation, which the maternal grandmother violently opposed. The mother had returned to live with the maternal grandmother. The latter had violently opposed the marriage and had grim satisfaction that it had not been successful, a matter in which she played no small part. The mother had not wanted the pregnancy, feared it throughout its duration and fear of further pregnancy featured in the separation. There was bitter resentment toward her husband, which carried over unconsciously to his child. This was camouflaged in seemingly genuine, conventional protest of anxiety. Mary strongly resembled the father in appearance. She was a rather plain child. The mother had pictured her daughter as a story book, doll-like creature. Mary's lethargy and clumsiness were further sources of irritation. The grandmother was convinced the child was feebleminded and constantly reiterated her opinion to the mother. The result was that the child was emotionally starved, and although given excellent physical care, was generally ignored. Long hours in a play pen without adequate opportunity for exercise or the stimulation of companions had removed all incentive toward activity. She was content to sit for long periods and look at pictures in books. She seldom talked or cried.

Mary was a pathetic youngster, who stood all the physical examinations stoically and impassively. She seemed entirely detached. On psychological examination she showed superior ability. The test was uneven because of her passivity. After physical study had revealed no basis for anxiety over her physical condition, she was seen regularly in the clinic. After considerable stimulation a brief spark of spontaneity could be aroused. It appeared as if she feared to enjoy herself. On one occasion in the playroom she made a feeble imitation of another child throwing a ball. It unfortunately hit a window, and although nothing happened, she could not be induced to touch another toy. The unhealthy emotional attitude that surrounds this child is largely responsible for the lack of development. Treatment has not been successful, for it has meant fighting the malign influence of the grandmother at each step. She does not want the child to be normal. The mother has been in a difficult situation because she does not dare defy the grandmother. Salvage was attempted by means of nursery school and a short period at camp. Attendance at nursery school was irregular, as the mother was willing to resort to any subterfuge to keep the child home. The period at camp was not long enough to accomplish much although Mary learned to dress herself. She took part in the games and seemed happy although aloof from the group. The grandmother is still convinced the child is subnormal. The mother retains her ambivalence and Mary continues to develop slowly. The tragedy is that there is nothing anyone can do to alter the situation.

The aim of the pediatrist should be directed not only toward the development of physically healthy children, but also toward the development

of mentally sound and well-adjusted individuals capable of functioning at the full level of capacity. It is his responsibility to see that the first steps toward emancipation from the home are taken early. These are often delayed until the child reaches school age. The poor preparation for group activity which is inevitable at this time may easily give rise to feelings of inferiority that impair good social contacts. Stress should be placed on the early acquisition of self-reliance and independence, for these are necessary attributes to a well-adjusted personality. Handicapping parental attitudes toward the child should be recognized and altered before they can wreak devastation.

As refinements of diagnosis and treatment methods have been developed in the realm of physical illness, the physician should have more urge to devote time to the study of the individual child as a human being in relation to his surroundings. If we are to advance in our program of prevention against mental illness, the start must be an active one during the pre-school years. Pediatricians and family physicians must feel more responsibility in assuming a broader understanding that emotional health is as important as physical health. To ensure good mental health the investigation must go more deeply than the consideration of the child alone, but often must extend to the reconstruction of attitudes of those who surround him.

When firmly established problems are encountered where the ramifications are so widespread that reconstruction becomes too time-consuming, the psychiatrist and the guidance clinic are prepared to assume re-education for the physician in practice. In this way the one branch of medicine supplements the other. If better mutual understanding of both fields is created, a much sounder and more productive order of prevention of mental illness, which today exacts such a tremendous toll from society, will result.

MENTAL HYGIENE IN THE SCHOOL*

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THE public school offers an exceptional opportunity for public health work. While the physical health program with its required medical examinations and inspections, Mantoux testing and health education is better known and better developed at the present time than the program for securing better mental health among the pupils, it cannot hope to contribute as much to human welfare. In this paper I intend to present those major objectives of mental hygiene which are related to the school life of the child. These objectives may not seem very new or very dramatic; but they are sound and have been proved empirically in clinical psychiatric practice a thousand times over.

It is very difficult to say anything new about human nature. One of the great assets of mental activity is its ability to guess at things and often guess correctly. People have guessed and guessed about human nature, and have hit upon almost every possible theory to explain behavior. The undramatic task of scientific psychiatry is to discover what is true, and it is usually found that somebody's lucky guess has anticipated its results. The biggest contribution of psychiatric investigation is not in the novelty of its findings, but that it offers a safer basis for human progress than the flashy guessing of the amateur who, in the words of Artemas Ward, "knows so much that ain't so." It is usually "the stuff that ain't so" that makes newspaper headlines as scientific material about human nature today. It is sufficiently absurd not to disturb anyone's psychological defenses. Valid observations are usually "old stuff" if they are not offensive—which is to say, if they do not attack our defenses against our repressions.

If a scientific observation of psychiatry does attack our psychological defenses, it is usually counter-attacked by a motley group rang-

*Presented before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

ing from the most poorly educated charwomen to the most successful and best publicized scientists who can be scientific about everything but their own private lives. This paper, let me hasten to assure you, should not attack your defenses. But to get into our subject—

Mental health has been defined by the White House Conference as "the adjustment of individuals to themselves and the world-at-large with a maximum of effectiveness, satisfaction, cheerfulness, and socially considerate behavior, and the ability to face and accept the realities." Defined in another and more negative way, mental health work seeks to reduce the occurrence of mental disease, personality handicaps, feeblemindedness and delinquency. All of these latter conditions represent failures in the adjustment of the individual to life, and constitute a major problem in our civilization.

Each year there are as many first admissions to mental hospitals as there are students matriculating in our Universities. Five per cent of all fifteen-year-old children will develop such a serious mental illness sometime during their lives that they will be forced to enter a mental hospital. In addition to these severely maladjusted people who occupy more than half of all hospital beds, there is a much greater number whose lives are detrimentally affected to a lesser degree by minor mental illness such as neurosis, or by personality handicaps such as inferiority feelings, self-consciousness, moodiness, sensitivity, irritability and the like. This latter group may be likened to sufferers from arthritis whose efficiency and happiness in living is materially reduced, although they are not denied the appearance of normal health.

A mental hygiene program in a school system works to reduce the number and severity of these handicaps as they develop in school children, and furthermore attempts to bring about a situation in schools that will promote better mental health in all pupils. At the present time, this goal is sought through the discovery, and elimination or reduction, in the obstacles to mental health that arise within the school system itself. Quite a number of these obstacles that warp children's personalities and tend toward the production of maladjustment, mental illness or delinquency have been discovered, and constant progress is being made in their removal.

School Failure Forced Upon the Dull

What are some of these obstacles or sources of infection, as they might be called by analogy? The first and perhaps the best recognized factor that attacks mental health in the school is the impossibility for the duller children to win success, no matter how hard they try. There are perhaps ten to fifteen per cent of the school population who are innately lacking in intelligence or school ability to such a degree that they are denied the opportunity to do a satisfactory job. This, of course, produces frustration and a feeling of inadequacy which is unhealthy. Nature's defenses begin to work then in these children, and compensations are sought for this need which is unfulfilled. Some children may be fortunate enough to have assets in physique or special abilities, etc., so that they can compensate in a way which is not harmful. Others, however, possessed of no such equipment, may find compensation in retaliatory, bad-boy behavior or through withdrawal into phantasies of success and the like, and the basis for further maladjustment or mental illness is laid.

Child Guidance Clinics can show case after case of personality maladjustment that went to extreme degrees with this factor of the impossibility of winning success and approval in academic work as the sole or coöperating etiological agent. This particular obstacle to mental health arises out of the fact that it takes a full six-year mental age to handle first grade work, a seven-year mental age to handle second grade work, etc. A child with an I.Q. of 80 for example, is not mentally up to the average six-year-old until *he* is eight years old. He simply can't do first grade work in a satisfactory way until he has spent two years more in developing his ability than the average child takes to reach that point. If he enters school when he is six, failure is forced upon him in spite of his best efforts to keep up with his age group. In the past, he has either been held back and forced to repeat the grade, or sent on to the next higher grade where he found daily failure in his assigned tasks facing him again.

The only way that this obstacle to mental health may be reduced is to teach the child in school what he is able to learn—no more and no less. It is perfectly possible for teachers to know in the present day what school ability a child pos-

sesses. The individual intelligence tests have proved themselves to be beyond doubt a very reliable measure of academic ability. School administrators and boards can make these measurements available to teachers on all pupils so that, knowing what the child is capable of learning and what he is not capable of learning, the teacher can adjust her teaching to his level of ability and avoid the mentally unhealthy result of requiring work that can't be done. This, of course, means that the teacher must individualize her work in the classroom, and that can't be done unless the size of the class is smaller than when the group is treated as though it is homogeneous in the matter of school ability. This adjustment to the needs and capacities of the individual children is being made in an increasingly large measure throughout the country, and it is largely due to the mental hygiene emphasis upon this point as a fundamental necessity in securing better mental health for pupils.

Poor Work Habits Resulting From Brightness

A second factor in the school producing maladjustment and personality distortion is closely related to the first. It is the lack of challenge and interest that results when a child much brighter than the average is given tasks too easy for him. Habits of indolence and lethargy and a feeling of false superiority may be produced which handicap the child throughout the rest of his life. Good work habits are of tremendous importance in determining a person's success in later life, and frustration and failure in meeting expectations are often the lot of the adults who were allowed to "get by" too easily in their school years because of superior intelligence. The remedy that is recommended and is being put into application slowly in schools to correct this obstacle to mental health is the same as in the case of the adjustment to duller children. In this case, of course, the pupil being *more* capable is given work of a more difficult grade—work that is challenging and interesting.

Effects of Specific Reading Disabilities

A third obstacle to mental health found in our schools arises out of the fact that reading and writing are such important tool subjects that everything else depends on the ability to master them. Now some children, though otherwise intelligent, suffer from a specific disability in learning to use written language. We all recognize readily that an intelligent person may be tone deaf and find it impossible to recognize or sing a tune correctly. That represents a specific disability in music. People so handicapped are not bothered much by it because it is possible to avoid singing without dire consequences. Not so in the case of those individuals who can't learn to read or spell with ordinary proficiency, however. Such cases were first described by Kussmaul in 1877, and he called them "word blindness." Hinshelwood, a English ophthalmologist, gave us the first intensive study of the condition in a monograph published in 1917. Many children had been referred to him because it was thought that their inability to read was due to some disorder in vision. This did not prove to be the case, but Hinshelwood called attention to the fact that there were often several such cases in one family, and that the symptoms these children showed were closely parallel to those which appear in some adults who have lost the capacity to read through an injury to the brain. He thought the condition might be due to an agenesis in the angular gyrus (speech area) of the dominant hemisphere. Evidence from autopsies has not supported this theory. Samuel Orton at New York Neurological Institute has done a great deal of work with this condition, and has named it strephosymbolia, meaning "twisted symbols." One of the prominent diagnostic features of these cases is that they make many reversals and inversions of letters and syllables in reading and writing. "Dog" is read "God" and "on" is read "no," but such errors are not made consistently by the child so that a word may be read correctly once and reversed the next time it is met a line or two down the page. The letters *b*, *d*, *p* and *q* are usually very badly confused due to their similarity. These children may be so severely handicapped that they are still unable to learn to read even the simplest material after years of schooling. One eleven-year-old boy with superior intelligence whom I saw could not read a single word, and could recognize only a few of the letters of the alphabet. Others are not so severely handicapped, and may be able to read and write with great difficulty and always make a large number of errors. About two per cent of our school children are so seriously affected by specific reading disabilities that they can make only the most

meager progress in school work. The disability seems to be related in many cases to speech defects and to shifts in handedness from one side to the other.

The personalities of these children usually become seriously distorted because they are so often taken to be feebleminded. They even seriously question their own intelligence. If their intelligence is recognized, they are then thought to be stubborn by their teachers and parents, and under the pressure that is put on them to learn to read often grow to justify the characterization. All forms of compensatory behavior show up in these children. Their relationships to their teachers, companions, and even parents is oftentimes deleteriously affected by their school failure and very undesirable personalities may result.

From the standpoint of school mental hygiene, an adjustment must be made to these children. Fortunately, it is possible to teach most of these children to read and spell satisfactorily if they can be given individual instruction by a patient, kind person who will try out all the techniques that can be used to teach reading until she finds out what will work for this particular child. The more progressive school systems are employing such tutors and also training some of the teachers in lower grades to use a wider variety of teaching techniques while avoiding a degree of pressure that develops an antipathy to the subject in the pupil.

Teachers' Personalities

A fourth obstacle to mental health in the school is often found in the personality of the teacher. Several careful studies have shown the greater percentage of personality and behavior problems that appear in the classrooms of embittered, harsh, cold, perfectionistic, sadistic or pedantic teachers. Parents who are good observers can usually notice the changes that show up in their own children's personalities as they move along from one teacher's influence to another. Teachers who, out of some personality quirk of their own, require the pupils to maintain a "pin-drop discipline" and to behave in such utterly unchildlike ways—ways which are inappropriate to any other contemporary or future situation—do a considerable amount of harm to children's personalities and should not be allowed to go on with their methods.

One should not be too harsh, however, in condemning the teachers for unfortunate personalities, because the narrow way in which they are required to live by the parents and community as a whole is so unrealistic and unhygienic that it, in effect, forces them to develop unhealthy qualities. The sanctimonious behavior that is required of them, the deprivation of the right to marry and still hold their jobs, the inadequate salaries many of them have to exist on, all foster suppression and frustration and personality distortion. Such regulations and super-moralistic requirements made upon school teachers tend to keep out of the profession many normal, warm, vital personalities and tend to produce maladjustment in those who remain in the work. This has its undesirable consequences in the pupils' personality development.

A thoroughgoing effort to solve this problem of securing teachers with normal personalities and keeping them that way can hardly be said to exist any place in the country today. Teachers are still being selected very much in terms of their academic records alone with no consideration given to the effect their personalities will have on the pupils' mental health

In closing, I should like to impress upon you again that these problems of which I speak are *health* problems. They have had all too scant attention from physicians who are otherwise interested in promotion of health and disease prevention. There is nothing vague or abstract about these obstacles to mental health. It may be that the average physician's dislike for personality problems, which probably arises out of his feeling of unfamiliarity in this province of medicine, has prevented him from finding the causes for the behavior disturbances he sees in his practice. Work such as is being done in the child guidance and other psychiatric clinics throughout the country is clearing up a good many of the mysteries of personality distortion and bringing order into a field which at one time was completely chaotic. The obstacles described briefly in this paper are matters about which there is general agreement among child psychiatrists and progressive educators. How many of them are still operating in your community to cut down the chance for mental health of the young people growing up there? How long will it be before the physician recognizes his responsibility to contribute to the elimination of these health hazards in our schools?

EMOTIONAL FACTORS IN ORGANIC DISEASE*

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THE doctor's first interest has been the cure of the sick. He has been most concerned with those critically ill. Because of this, his patients have been those who suffered with the more grossly pathological conditions and who therefore deviate most from the normal. The modern doctor is also interested in the prevention of disease. As his understanding of the well person has grown, he has become increasingly more concerned with preventive medicine.

This is the experience of the doctor in the diagnosis and treatment of organic diseases. In the treatment of functional diseases much the same progression has occurred. At first only the obviously insane were considered the province of the physician. As his knowledge of those with grossly abnormal behavior grew, he found that often the underlying causes of these diseases were found to have their beginning in childhood. Accordingly in time the physician extended his practice to the treatment of the less seriously mentally ill to include as well children with emotional disturbances.

Although the physician in the past has been concerned with the psychic disturbances which occur in the presence of organic disease, he has relegated them to comparative unimportance. In his study of the patient, he drew a definite line separating the mental and the physical findings. Failing to find evidence of organic disturbance, he dismissed the patient with the statement that his symptoms were a figment of his imagination. Having made such a diagnosis, his interest and concern ceased. However, the concern over the patient continued in another sphere, a sphere which, though largely legalistic, was actually the concern of the social worker. It was represented in the asylums for the insane.

The first real understanding of the illnesses of these patients followed the sociological contribution of Clifford Beers in his own story, "A Mind that Found Itself." This is the story of his experiences as a patient in the general hospital, later the private hospital for the mentally ill, and finally the state hospital for the insane and contains his recommendations for reform in the cure of the mentally ill. His indefatigable efforts in behalf of the mentally ill changed the point of view of the physician as well as the administrator. It was about this same time that Sigmund Freud made his early contribution to the understanding of the psyche.

From still another field there was evidence of the shift from the desire for vengeance to control of crime through a therapeutic device. This was represented in the program of probation and parole, the first of which went into effect nearly one hundred years ago.

About this same time, there were evidences in other fields of a changing attitude toward the misconduct of persons who presumably were without organic disease. I refer to the change from the determinate to the indeterminate sentence for the adult criminal. Such changes suggest that the community has come to be more interested in the offender than in the offense.

From still another direction came an approach to the problem in behalf of delinquent and criminal children. It was in 1899 in Chicago that the first Juvenile Court was established. The so-called sentimentalists' point of view held that delinquency and criminality in children were symptomatic rather than inherent and that the conditions which were reacted to with delinquency were remediable. In its philosophy there was the principle that punishment to be effective must be administered as treatment directed towards the correction of the causes underlying delinquency.

We may consider, then, five separate efforts for the better understanding of conduct disorders in human beings, the first of these being a continuation of the progress of scientific medicine; the second, the combined efforts of medicine and sociology in behalf of the insane; the third, the practice of probation and parole of criminal offenders; the fourth, the institution of the principle of indeterminate sentences; and the fifth, the Juvenile Court, and behavior clinic with its combined medical, psychological and sociological ap-

*Read before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

proach to the understanding of behavior difficulties in children.

Although a generation ago, scientific medicine did not concern itself with the gross disorders of conduct, the last twenty years of medicine have brought a great change in this direction. However, in spite of this, the physician still rejects as a problem of some other worker, the person whose symptoms cannot be explained as of organic basis. A significant change in this attitude is expressed by Barrow in his lectures published under the title, "The Patient and the Art of Living—An Approach to Psychosomatic Medicine."[1] Barrow has given to the student of medicine his approach to the patient and defines psychosomatic disease as follows:

"A condition in which the chief complaint is usually physical, the subjective symptoms are usually out of all proportion to the physical findings, and there is always an underlying and often obscure mental or psychic disorder based on a constitutional inadequacy and on some environmental or circumstantial conflict."[1]

To illustrate the importance of dealing with the patient's problems as a whole, he quotes from the record of a patient examined by a psychiatrist.

"The patient had been told that she was a Peter Pan type of individual, that she would have been all right if she could have remained a child and that it was a mistake for her to have assumed the strain and obligations of married life and motherhood. 'Well,' she said, 'That may be true, but what am I going to do about it now? I still have headaches.'"[1]

Dr. Barrow adds:

"I do not wish to minimize the help that may be rendered by psychiatric consultation and advice but what is needed in the attending physician is not a highly specialized knowledge of psychiatry or of any other of the specialties but rather a breadth of medical vision and skill that will enable him to make the patient comfortable. In addition he must have a large fund of patience and compassion and common sense so that he can establish contact with the patient and win his confidence. The proper approach to these cases might, therefore, be said to be one-third psychiatric, one-third physical and one-third compassionate guidance in the Art of Living."[1]

Barrow reports the findings in a series of 250 patients whom he classified as psychoneurotic persons. In his series, 37 per cent complained primarily of gastro-intestinal disturbances. Second in frequency are cardiovascular symptoms, this being the primary complaint in 17 per cent. Then follows malaise and fatigability 14 per cent; aches and pains, 10 per cent; menopausal symptoms, 7 per cent; sore and aching throat, 5 per cent; arthritis, 4 per cent; genito-urinary, 3 per cent. He also includes neurogenic fever, a low grade fever for which no organic cause is determined. He suggests that in spite of the anxiety of the physician, the desire "to follow the daily temperature curve as a stock broker might follow the ticker tape, it is usually advisable to have the patient throw away his thermometer and forget his fever."[1]

In discussing anxiety states and depressive neuroses which account for about 40 per cent of the male cases, Barrow states that without psychiatric study it is seldom possible to find a cause.

"The anxiety state may often be traced to childhood environment or experiences, even to anxieties never consciously experienced; but the emotional state has been 'displaced' from the original object and transferred to other objects, or anxiety has in fact become a habit of thought. Thus, for example, the child whose tranquillity and security have been threatened by marital discord of the parents grows up into a person surrounded with thick banks of gloom who, although he recognizes that he is no longer dependent on his parents for happiness and security, still approaches each new episode of life with fear. To treat these individuals properly, one must completely rebuild the personality, a task calling for a skilful psychiatrist."[1]

That considerable medical confusion exists over the significance of emotional factors even in the presence of organic disease is in part due to the looseness with which the term psychoneuroses is used, according to Esther Loring Richards.[4] She suggests that there is even some danger in affixing a label to such patients, even though it be a correct one. She writes:

"The term psychoneuroses sounds more modern and scientific than neurasthenia, but from the standpoint of usage and subsequent treatment of the patient it is equally dangerous. First of all, it continues to carry on the medical confusion of a sharp contrast between poor mental health that is supposed to be benign and poor mental health of the outspoken psychoses that are medically recognized as serious enough to call for instant psychiatric help. Secondly, the internist is encouraged by this same old concept to employ essentially one line of treatment for all people whom he considers psychoneurotic."[4]

This danger is also dealt with by Plant in his book "Personality and the Cultural Pattern." He refers to the tendency on the part of physicians to place human beings into certain categories based on an examination which does not include adequate consideration of the cultural background. For example, a patient who is said to be suffering from dementia precox and therefore incurable, acquires thereby an irrevocable future. It is a well known fact that whereas the admissions to the hospitals for the mentally ill reveal an incidence of about 30 per cent of dementia precox, the resident population is nearer two-thirds. In like manner, the child whose intelligence has been tested by a formal method thereby is "given an intelligence quotient" and is to some extent permanently categorized. Until we deal with the meaning that underlies our diagnostic findings, we shall not be able to avoid such dangers.

More recently there has been a growing tendency in the medical schools to teach that the diagnostic procedure must concern itself with the person as a whole and as a part of a larger presence extending into his immediate environment. This is perhaps an extension of the point of view of medical schools generally to teach not only the diagnosis of disease of the various organs but also the reasons for the treatment to be used, a change from the empiricisms of the past. Now we teach the student of medicine that he is treating the person who is sick rather than the disease from which he suffers. In so doing, we are concerned beyond the immediate presence of that person. We may look on our laws regarding quarantine as evidence of this point of view, though of a limited sort. In the course of a newer point of view, larger emphasis is given to the behavior of persons who are ill.

Tremendous and growing interest has been exhibited in the relationship between emotional factors and physical change. Flanders Dunbar has called special attention to these changes in her volume entitled "Emotions and Body Changes." Winfred Overholser, speaking on the rôle of psychiatry in general medicine bears this out in his statement:

"There has been of recent years . . . a tendency of the general practitioner and of the specialist to overlook the whole patient while being preoccupied with certain of his specific parts. Many common examples of the physical manifestation of emotional changes will readily come to your mind. I need refer for example only to the very uncomfortable symptom of blushing on occasions of embarrassment, the presence of goose-flesh and nervous diarrhea in cases of fright, and the various types of physical response to sex stimulation to indicate that it is a common experience and a matter of general knowledge that emotional factors can produce bodily changes. Yet how often this fact is forgotten when a patient comes to the surgeon complaining of enlargement of the thyroid! Investigation has shown that many cases in which the thyroid is evidently putting out an increased amount of secretion are primarily due to emotional conflict and respond promptly to the resolution of those conflicts."[3]

In addition to the growing realization of the significance of emotional factors as the underlying cause of organic conditions such as gastric ulcer and other gastro-intestinal disturbances studies have been made which indicate that essential hypertension and bronchial asthma have large psychic elements in their etiology. French reminds us:

"Since earliest times it has been suspected that psychological factors play some rôle in connection with bronchial asthma. In the last few decades the discovery of the significance of allergic factors in this disease has tended to divert interest away from earlier observations that asthma is frequently associated with some sort of emotional instability and that asthma attacks are often precipitated by acute emotional conflicts."[2]

He reports the results of the psychoanalytic study of twenty-four cases of bronchial asthma. He concludes:

"The asthma attack is precipitated as a rule by a temptation which threatens to estrange the patient from a mother figure. . . . Numerous possible defenses against this conflict would suggest that the common feature in the otherwise divergent personalities of our asthma patients is the fact that the personality of these patients is built up in large part around the task of mastering by one means or another the patient's fear of being separated from the mother. . . . All these observations would suggest that psychological and allergic factors probably stand in a somewhat complementary relationship to each other in the etiology of bronchial asthma, that in some cases asthma attacks may be precipitated by allergic factors alone, in others by emotional factors alone and that in still other cases cooperation of allergic and emotional factors may be necessary to produce the attacks."[2]

To illustrate what asthma may mean to the patient is the following statement:

"There seems also be a very intimate relationship between asthma and crying or laughing. There is

much to suggest in fact that the asthma attack is really a sort of equivalent of a cry of anxiety or rage which has been inhibited or repressed. One of the first reactions of the child upon separation from the mother at birth is to cry and during early infancy and even later, crying remains the predominant reaction of the child in situations of helplessness when he can only wish for the mother to return to him. In later life this primitive cry is modified into speech and in confession retains the function of maintaining the bond between the child and mother. For some reason, in the situations which provoke asthma attacks the child is unable to cry. . . . Of particular interest, however, is the fact that we are sometimes able to observe the cessation of an asthma attack and the appearance of crying in its place."[2]

Perhaps the best illustration of the emotional factors in the presence of organic disease occurs in persons who are left with an obvious physical handicap. Alfred Adler has shown rather clearly the tendency of the human to react to physical limitations in a variety of ways. His theory of the inferiority complex based originally on the emotional conflicts over the presence of a real handicap was later extended in its hypothesis to the reaction to a feeling of inadequacy and inferiority. This has been carried further, calling attention to the fact that inferiority may be only as the condition deviates from the accepted standard. For example, persons with red hair being in the very limited minority deviate from the standard for human beings as a whole. Lipemial persons with blemishes or those having a large nose or even a snub nose appear in a similar category.

William Healy early recognized the extraordinary behavior of children suffering with organic disease. In one of his early reports he describes a child who was brought to the Juvenile Court because of delinquency. This occurred after he had been frightened by confinement in the local police station without avail. This responsible and reliable family was deeply concerned over his stealing and his rather sudden school failure and were greatly disturbed over the necessity for court action. Examination made by Dr. Healy revealed that the child was suffering from juvenile general paralysis of the insane and that his sudden change in personality from an industrious, well behaved, promising school child to one of school failure, truancy and delinquency was a part of the change due to the presence of syphilis. In like manner, behavior difficulties have occurred in children with disabilities of a more obvious nature, but which lend themselves to therapeutic effort. For example, a child brought to us for examination at the request of the judge of the Juvenile Court had been charged by the police with twenty-five burglaries, all of which he admitted. His picture appeared in the newspapers wearing a man's felt hat, a handkerchief tied around his neck and a police revolver in each hand, with the caption "The Baby Bandit of Chicago." He was small in stature, came from a home in which the father was a rather poor provider but honest and reliable. The community in which he lived was classified as one of the middle class residential sections. The patient, though truant from home, had attended classes regularly. The school reported that he was a good student, an excellent reader, and in the fifth grade. There was only one complaint against him and that was that he was sometimes tardy in returning to class after recess. To the parents, his conduct was unbelievable. Examination showed that the patient was well nourished, well developed, with the exception of hypospadias. In response to intelligence tests he was found to be average and therefore properly placed in school. An attempt was made to get him to explain his conduct. To this he replied, "I can't make good. You've got to be a sissy to make good." A number of questions were naturally raised, especially with this comment from a boy who not only was obviously not a sissy but who admitted more criminal acts than he was guilty of. His father stated that until the child was about seven years old, he sat down to urninate. What happened after that time, the father did not know since the child would never permit a second person in the bathroom with him. We did have, however, in this an explanation for his tardiness at recess. Because of the presence of the hypospadias, he identified himself in a rôle which was intolerable to him. His violent reaction to it can be understood as the degree to which he rejected that rôle.

In planning treatment for this child, it became evident that some immediate steps must be taken to effect a change in his attitude toward himself and perhaps this would necessitate removal from the community. Possibility of plastic surgery was considered, but the recommendations were not carried out. Within three months, he was back in the hands of the police, having returned to his former behavior. This

time, the recommendations were ordered by the court to be carried out. In considering the usual indications for surgical intervention in hypospadias, one must consider here also the nature of the interpersonal relationships about to be thrust upon him by virtue of his emerging adolescence.

Let us pass to the consideration of emotional problems in children who are free from organic disease. By way of illustration, I should like to present the following case:

A boy fifteen years of age, living in a middle class residential section of a large city, was arrested by the police for stealing small articles from a department store, including mechanical pencils, rubber balls, and an inexpensive electric clock. Along with two other boys, he was also charged with damaging a number of women's hats as he poured liquid ammonia down an air chute in a store. In still another store, these boys threw stench bombs, one of them setting fire to drapes hanging over a railing.

When the police apprehended them, this boy accepted the major blame. He was placed in the Detention Home pending completion of the investigation.

It was rather surprising that this boy should become delinquent. He was doing excellent work as a sophomore in high school. He is the son of parents, both of whom are physicians, who themselves have strong moral convictions and who served as medical missionaries in China until the older brothers and sisters were ready for higher education.

The father is now president of the Parent-Teacher Association of the school which his children attend. In this family there are three older children in college; a younger sister is in high school. The burden of supporting these children is almost more than the father can afford, even though he has a busy practice of medicine among the people living in his community. Because of these limitations of funds and the rather positive convictions of the parents, the children are set apart somewhat from others. Their status in the neighborhood is seriously affected. The patient's meager allowance was completely withdrawn when the parents discovered he was spending it on candy. He met the situation and the need for status at first by employment in a job delivering papers. This, however, did not last long. Subsequently, he heard from another boy that it was a simple matter to walk into a store and drop articles into a shopping bag. After a time, he began taking things in this manner and sold them for small amounts to other boys in the neighborhood. He justified such actions on the grounds that the store owners were wealthy people who would never miss the few articles he took.

In this boy, of good physical development and health, with fine intellect, with excellent academic adjustment, we observe reactions to profound emotional tension. He is fully aware of the great difficulties which his parents have in meeting the cost of living. He admires his father for his devotion to duty and his mother for her self-sacrifice. He cannot justify taking advantage of their small store of funds. A growing resentment has developed over the family's deprivation, which, by comparison with his neighbors, is great. This resentment is directed towards the well-to-do and expresses itself not only in the small thefts but also in the damage to property and the expression of hostility which is so strikingly effected through the means of the stench bombs.

This child evidently feels set apart from others in the community, in effect has virtually withdrawn from the place which the family holds and which his older brothers and sister are carrying on. Unless his point of view and attitudes towards himself and others are very greatly changed, he may be expected to continue in the direction toward which these delinquencies point. Of greatest importance in therapy is an awareness on his part of the psychological motivation. To this end psychotherapy is indicated.

In summarizing, I should like to repeat that in nearly all organic diseases, important emotional factors exist and that the physician must be concerned with these. He must be concerned with the patient not only as an individual but as a whole being. In the process he must proceed from consideration of the patient into his immediate social contacts. The extent to which he must go will be evident only in his personal relationships. In the treatment of the sick patient, the emphasis must shift from the treatment of the disease to the treatment of the patient.

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TREATMENT OF MENTAL DISORDERS WITH PHARMACOLOGICAL AND ELECTRICAL SHOCK METHODS

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SHOCK therapy is now widely recognized as an effective therapeutic measure in the treatment of certain mental disorders and is being used in one form or another in most of our leading institutions. However, its universal adoption is being retarded because occasional serious complications have been encountered in the more drastic methods which are commonly used. Insulin-hypoglycemic and metrazol-convulsive shock continue to be the most popular methods used, although encouraging results are claimed with picrotoxin, triazol and other pharmacological convulsive-shock therapies. Electrical-convulsive therapy was introduced two years ago with the purpose of avoiding some of the dangers encountered in pharmacological-convulsive treatment. Scores of European and American workers are now investigating its merits, but whether this type of therapy is safer than pharmacological shock treatment remains to be proved. In May, 1939, the writer[3] introduced faradic shock therapy, a safer form of treatment which appears to be producing results paralleling those obtained with the more drastic methods. Shock therapy is not only proving to be a valuable adjunct in the treatment of mental disorders, but it is also giving us important information helpful in clarifying our understanding of the mechanisms involved in various mental disorders.

Shock treatment has been developed empirically, and numerous hypotheses have been propounded in an attempt to explain how it is effective and when it should be used. When insulin shock therapy was first introduced a certain group thought that at last an effective chemical treatment had been discovered and that all of the previous psychological theories could now be discarded. Others argued that relapses were so frequent and the treatment so heroic that it could hardly be recommended unless more striking and lasting results were obtained. Still others continue to maintain an attitude of conservatism because some deaths have been reported and because irreparable damage to the brain has been demonstrated in severe and prolonged attacks of hypoglycemia, either induced or spontaneous. But the great majority of workers who have used pharmacological shock treatment continue to express enthusiasm with their results in spite of its drastic nature.

Disadvantages of Our Present Classification

To understand which types of mental disorders may be most benefited by shock treatment a consideration of our present form of classification is pertinent. In 1896 Kraeplin[25] offered a classification based on symptoms which, with very little modification, is still being used. This classification tends to regard various forms of psychoses as definite entities entailing certain prognoses. According to Meyer[26] Kraeplin himself admitted that the cause of mental disorders was unknown, that the course varied, that the outcome of many cases was uncertain and that no specific lesion was demonstrable. Until the underlying causes of mental illness are better understood, classification must be considered purely tentative and inconclusive. A classification founded upon uncertain premises may be useful in the description of group psychoses, but it is fraught with danger when applied to the individual case.

Freud[14] was the first to show that a close relationship exists between hysteria, the prototype of psychoneuroses, and schizophrenia. Jung[24] drew a striking parallel between dementia precox and hysteria. Pavlov[29] has offered considerable evidence to show that schizophrenia may be regarded as a marked degree of chronic hysteria. Bleuler[6] stated that one can demonstrate a schizoid type of reaction as well as a manic component in every person in extremely varying degrees, and it is simply a question as to which reaction predominates. In this country Meyer and Campbell have been leading exponents in showing the disadvantages of a symptomatological classification, and stress the necessity of regarding mental disorders as merely individual reaction types effected by environment. Meyer[26] points out the need of new and open concepts for practical work, research and the presentation of

the issue to student and laity alike. Campbell[8] says that we should utilize the concept of a schizophrenic reaction type as one accepts an hysterical, or an affective reaction type, as all are precipitated by emotional stress or by failure to meet life situations. The resulting psychoses are merely expressions of certain types of constitutional weaknesses. Constitutional weakness is due in part to inheritance and is also the product of poor life habits. Briefly stated, mental disease represents an exaggeration or a caricature of the individual's personality. The constitutional makeup of the patient prior to the onset of the psychosis has more bearing upon his prognosis than the presenting psychotic symptoms. Thus it is obvious that a symptomatological classification is unsatisfactory, and that a thorough understanding of the individual is necessary if one hopes to treat these patients effectively.

Use of Shock Therapy in the Past

Shock therapy is not a new procedure in the treatment of mental disorders. In the earlier methods unplanned fear and suggestion were apparently the active psychotherapeutic agents employed. It may be quite possible that the ancient practice of trephination was a primitive form of shock therapy. This operation was performed for mental disorders with the belief that "confined spirits" were allowed to escape. It was widely used, for neolithic skulls with discs of bones removed have been found in nearly all parts of the world.[28] Terror and fear as well as suggestion producing profound physiological changes of the nervous system must have prevailed during such operations. Benjamin Rush[31] in 1817 cited many cases of psychoses cured by fear. Deutsch[11] writes of various technics used from 1780 to 1830 to frighten the patient out of his psychosis. In 1828 Burrows[7] recommended that insanity might be cured by provoking fits with the administration of large doses of camphor.

During the past two centuries electricity was popular from time to time in the treatment of mental disorders. In the middle of the nineteenth century the use of electricity became so popular that Huff[21] remarked that mental illness should not be considered incurable until electricity in some one of its forms had been tried. Sir Clifford Allbutt[1] in 1872 made a systematic study of the use of electricity in the treatment of mental disorders. He used a continuous current, applied to the patient's head for ten minutes each day. Evidence of sympathetic nervous system stimulation such as "flushing of the face, giddiness, increased pulse rate and dilatation of the pupils" were noted in most of these patients. He observed marked improvement in acute primary dementia, distinct improvement, but to a less degree, in mania and recent secondary dementia, no change in chronic dementia and "brain wasting," and unfavorable results in hypochondriacal melancholia. Today few claim better results with current forms of shock treatment. Erb[12] discussed the vasomotor effects produced by electricity in an article written in 1883. It is of interest to note that he pointed out that vasomotor disturbances play a dominant part in the development and symptomatology of many forms of psychoses. In 1884 Haynes[19] observed that early functional diseases were benefited by electricity, whereas older and organic conditions showed no response. Blandford[5] in 1886 believed that the encouraging results obtained in mental disorders with electrotherapy were due to "moral" rather than to physical causes.

As a counterpart of the red-hot iron used in the middle ages, the Paquilin cautery has been used within our own generation as a form of shock treatment.[27] This instrument had a hollow platinum point which was kept hot by benzene vapor passing through it. In recent years many new experimental methods of shock treatment have been tried. Various types of induced fever therapies such as malaria, sulfosin and African tick fever have been tried, but results on the whole have been disappointing and inconclusive. Similar experience has been reported with foreign protein shock and leukogenic shock treatment. In the latter method fixation abscesses were produced by cutaneous injections of turpentine.

Janet[23] has regarded these forms of treatment as procedures by moral as well as physical means, or as "treatment by excitation." While admitting that some of these methods may have some merit he warned that exhaustion is a great danger in such therapy. With insulin-hypoglycemic and the various forms of convulsive shock therapies the patient is left in a comatose or unconscious condition whereby extreme apprehension or exhaustion is avoided. When subconvulsive doses of metrazol are given, the patients are left in an

excited and apprehensive state and unsatisfactory results are obtained by this procedure.

Current Theories of Shock Therapy

Although the use of shock treatment is increasing, differences of opinion still exist as to why it is effective. The theories advanced by Sakel have been criticized by Cobb[10] and Gellhorn.[16] A review[32] of Sakel's monograph recently published states, "the clinician will profit from reading the monograph provided he ignores the theoretical and considers only the factual part of the exposition." The theories advanced by Meduna have been attacked by Harris[18] and others.

Gellhorn[16] offered a theory that insulin, metrazol and other drugs used in pharmacological shock therapy benefit the patient by producing anoxia which stimulates the autonomic nervous system in the hypothalamus. Friedman[15] speaks of shock therapy as an irritative therapy which stimulates the central nervous system and breaks up "physiological barriers" to certain associative pathways. Bennet[2] suggested that the effects on depressive conditions are probably due to the efforts of the patient treated to prove to himself his willingness to undergo punishment, with a subsequent resolution of his guilty feeling. Some[22] believe that the shock treatment increases the metabolism in the brain by a sudden rise of the systemic blood pressure. It has been suggested by Querido and Van der Speck[30] that shock treatment does not make patients more social but merely more submissive. Many workers[33] maintain that fear alone is the main effective element. They speak of the patient's fear of the shock treatment as a fear of death or as a "threat of extinction." The frequent observation that psychotic patients temporarily lose their psychotic symptoms or improve when their life is threatened with an acute infectious illness or when subjected to a sudden emotional shock or a major surgical operation supports this theory.

In contradistinction to older medical views that a dichotomy of the mind and body existed, it is now generally agreed that there is a psychosomatic interrelationship between psychological and bodily functions through the medium of the autonomic nervous system. When an individual is unable to face the realities of life, emotional conflicts develop. These conflicts interfere with intricate adjustments necessary in life and the lower and automatic centers of control then assert themselves. Consequently the individual no longer has a harmonious and fully integrated behavior. A vicious circle becomes established and uncontrolled psychic reflexes tend to accentuate and prolong the newly acquired abnormal mental behavior. During the acute stage little can be done by the customary psychotherapeutic approach since the patient is often mute, unwilling or unable to coöperate. After the acute stage passes it is often too late to accomplish much by pleading with reason, for the patient has drifted into a reconstructed world and he is no longer able to cope intelligently with his daily problems. Cannon[9] stresses the futility of trying to argue patients out of their emotional reactions since the cortex has no direct control over the autonomic nervous system. For this reason interviews, explanatory talks and reassurances are usually found to be inadequate.

Gellhorn[16] has pointed out that pharmacological shock treatments act as a powerful stimulation to the autonomic nervous system. This is obviously true also in the different types of electrical shock therapies. Henry[20] says that the autonomic system elaborates the current feeling by a reflex mechanism whether a person is responding to external danger or to internal conflict. According to Singer[34] the presence of a psychosis always indicates a disturbance in this system. Therefore it appears that shock therapy through autonomic stimulation in some way dislodges hallucinations, delusions and other symptoms disturbing to the patient which occur in psychoses. The exact process by which this takes place remains obscure. Probably different factors operate in different cases depending upon the individual reaction types. In some cases shock therapy may act as a planned fear reaction which may bring about an interruption of abnormally established thought habits and permit a reorganization and readjustment of a more normal thought flow. Or the action of shock therapy may in a broad sense be likened to a form of counter-irritation. Undesirable habit thought patterns are forcefully replaced by a real and visible threat to the organism and through activation and motivation the patient is brought back to face realities. In some of the depressed cases it may bring relief from a feeling of guilt by their willingness to submit to shock therapy which they regard as a punishment. Other patients may summon all of their resources to

face reality in order to avoid further treatment. But the writer believes that "treatment by excitation" according to Janet's use of this term is the modus operandi in all forms of shock therapy. It must be emphasized, however, that additional means of psychotherapy such as explanation, re-education and guidance in conjunction with shock therapy are necessary to procure the best results.

Comparison of the Current Forms of Shock Treatments

The writer believes that all forms of pharmacological and electrical shock therapies produce similar effects since all are psychophysiological methods. Two conditions are known to occur: (1) powerful stimulation of the autonomic nervous system, followed by (2) depression or temporary inhibition of the higher cerebral centers. Increased pulse rate, elevation of the blood pressure, dilatation of the pupils, flushing of the skin, and increased salivation are some of the evidences of autonomic nervous system stimulation. After this stimulation the higher centers are depressed or temporarily paralyzed by the resulting coma or unconsciousness in pharmacological and electrical-convulsive shock therapies.

In a search to find a safe and better controlled substitute for pharmacological and electrical-convulsive shock therapies, the writer devised a method which he believes can produce similar effects by safer means. For stimulation, a faradic current well within the margins of safety is used in place of drugs. This current is not strong enough to produce convulsions or irreversible physiological changes. Immediately following a brief series of electrical shocks which are applied to the patient's head, an intravenous barbiturate (pentothal sodium) is administered for a quick anesthesia. In non-communicative and stuporous patients, additional information regarding their condition may be obtained by using a subanesthetic dose of intravenous sodium amytal instead of pentothal sodium. By the use of either drug the higher centers are temporarily inhibited and the patient is left in a relaxed condition which is attained under better control than is possible with the other shock methods. An immediate improvement may be obtained in stuporous and non-communicative patients with intravenous sodium amytal alone, but this change is very temporary. A full description of the apparatus and technic of faradic shock therapy has been published.[4]

In all methods it appears that best results are obtained when the personality is acutely and more or less totally involved and when the psychotic symptoms are decidedly unpleasant to the patient. In so-called catatonic and paranoid types of schizophrenia the results are far superior to those obtained in the simple and hebephrenic types. In the more chronic forms an adjustment is usually made at a lower level of mental activity. After six months to two years it appears that the psychotic symptoms become less disagreeable to the patient, and consequently they are less likely to respond to shock therapy. In the affective disorders the depressed types respond far better to shock therapy than the hypomanics and manics for these latter types usually retain a keen awareness of their position and environment and have fewer unpleasant symptoms which annoy them. Most dramatic results are obtained in acute hysteria for recovery usually takes place with the first treatment with convulsive or faradic therapy. The chronic forms of psychoneuroses are not greatly benefited by shock therapy. In these individuals the personality is partially involved over a long period of time and they have been in the habit of making only partial adjustments. Temporary results are obtained in this group after the first few shock treatments are given, but lasting results can hardly be expected since most of these patients do not want to get well emotionally, thought they may want to intellectually.

The relative efficacy of the different types of shock therapies remains to be established. Since mental disorders are not definite entities and in each case many complicating conditions exist, this question will not be answered until extensive statistical studies of the different methods are carried on over a considerable period of time. More rapid response is noted with metrazol, electrical-convulsive and faradic shock than with insulin hypoglycemic shock treatment. Improvement is usually noted within the first five treatments whereas with insulin-hypoglycemic shock the response is more gradual and a longer series of treatments is usually required. Some workers[35] have found that catatonic excitement and paranoid types react more favorably to insulin while stuporous patients respond best to metrazol. Others[17] believe that results with metrazol

closely parallel those with insulin. They recommend that metrazol treatment be given first since it is less expensive, for it requires less time to administer. Some[13] recommend combining or alternating these methods. The writer believes that the least drastic method (such as faradic shock) should be tried first. If the results are not favorable other methods may then be used. Using faradic shock therapy the writer obtained relatively as favorable results in all types of mental disorders as those claimed with other forms of shock treatment. With faradic shock treatment improvement is usually noted after the second or third treatment. This treatment is as inexpensive to administer as any of the shock treatments now in use.

All forms of shock treatment should be considered merely as an adjuvant to psychotherapy. Other forms of psychotherapy are essential. Shock treatment may relieve the patient of acute psychotic symptoms, but it does not materially alter his constitutional makeup. For this reason it is understandable why relapses may occur among patients who have had remissions through shock therapy as well as among those who have had spontaneous remission. But it has been found that many patients who have relapsed after shock therapy frequently respond to further treatment. When remissions are brought about by shock therapy the ultimate prognosis may be more favorable, since by terminating the psychosis abruptly through a specific means a better opportunity is offered to explain to the patient how his mental illness came about and to point out how further recurrences may be avoided.

Summary

Since insulin-hypoglycemic shock therapy was first introduced, several different forms of pharmacological and electrical shocks methods have been tried. The effectiveness of many of these shock treatments in mental disorder is now generally conceded but a search continues for safer methods.

Shock therapy is not a new procedure. It was used in many crude forms for centuries but one of its chief dangers was creation of exhaustion.

In the current forms of shock treatment two conditions are known to occur: (1) stimulation of the autonomic nervous system, followed by (2) inhibition of the higher centers. The former condition acts as a "treatment by excitation" and the latter prevents exhaustion. Similar conditions are produced under better control with faradic shock therapy and comparable results are more safely obtained. Its use is recommended before resorting to more drastic methods.

No form of shock therapy can be expected to alter materially the original constitutional makeup of an individual but it may remove acute and unpleasant psychotic symptoms.

Shock treatment should be regarded as an adjuvant to psychotherapy and for best results other psychotherapeutic procedures commonly used are essential.

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FEEDING THE PREMATURE BABY*

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THE care of the premature infant is one of the most fascinating problems in medicine. More and more interest in their care has been shown by the medical profession. It is a thrill indeed to see one of these tiny shrivelled dusky mites transformed into a healthy infant in a matter of weeks. Their progress is so rapid if they are properly treated that one can see the change in them from day to day and although the care they demand is much more time-consuming and specific than a normal newborn baby, the satisfaction derived from their progress fully repays one.

This discussion is intended primarily for the practicing physician who has but occasional use for information on the premature infant. Recently more requests have come for information on feeding than any other phase of premature care, and feeding, while no more important than any of the other phases, is perhaps the most difficult part of their care because it needs superpatience and care on the part of the attendants as much as promptness and exactness.

Taking it for granted that the physician is able to cope with the problems of keeping an ideal temperature and humidity for the baby and that an adequate isolation or aseptic technic has been set up to prevent upper respiratory and skin infections, the feeding problem can take our entire time.

The infant is not disturbed for feeding for a period of 16 hours or more after birth. This rule is not changed under any condition. The temperature of the bassinet is regulated as necessary to accommodate the baby's temperature. The admission temperature of the crib is always 100° F. but it is seldom necessary to have it that high for more than 2 to 4 hours and thereafter it is gradually lowered so that after a period of 24 to 48 hours the crib temperature is adequate when kept at 86° F.

Although the foremost aim of this 16-hour period is complete rest, the infant's temperature must be checked every 2 hours while the crib temperature is high, and his general condition must be watched closely especially for respiratory difficulty.

If the baby's condition is good after 16 hours have elapsed, feeding is begun. If, however, the infant's condition is poor, the rest period is continued for another 4 to 8 hours or until the baby has improved.

As in full term infants, the premature baby has a loss of weight during the first few days of life. However, the loss in a premature infant is relatively greater than in a newborn and is regained more slowly. The loss in weight should not average more than 7 to 8 per cent of the birth weight.

After the first few days, the total fluid intake should be maintained at from one-sixth to one-eighth of the body weight in each 24 hours. The sum of the water and milk intake determines the total fluid intake.

A good method for obtaining the required fluid intake during the first few days of life is to give subcutaneous fluids. Hartmann's solution or Ringer's solution may be used. The needles (20 gauge intravenous) are inserted into the inner aspect of the thigh just above the knee and passed toward the midpoint of the inguinal ligament. This should be administered very slowly, preferably by continuous drip. For a small premature, that is one weighing less than 1,500 grams (3.3 pounds) 50 to 75 c.c. of the solution is sufficient. This is given the third day

*From the Pediatric Division at the Minneapolis General Hospital and the Department of Pediatrics, University of Minnesota. Chairman's address at the Round Table Discussion on the Care of the Premature, presented at the eighty-seventh annual meeting of the Minnesota State Medical Association, Rochester, Minn., April 23, 1940.

and may be repeated daily if the baby is taking fluids poorly. Premature infants over 1,500 grams (3.3 pounds) to 2,000 grams (4.4 pounds) may be given 75 to 100 c.c. of the solution and those babies weighing more than 2,000 grams may be given 100 to 125 c.c. of the solution. Usually if an infant weighs more than 1,500 grams (3.3 pounds) only one subcutaneous injection is necessary, but the very small babies frequently need two or more.

In addition to fluids, whole citrated blood may be administered to the premature infant with beneficial results. This is most frequently given the day before subcutaneous fluids are started (during the second 24 hours of life). When this procedure is performed, 10 c.c. (⅓ ounce) are given to the small babies (1,500 grams or less in weight) and up to 30 c.c. (1 ounce) to the larger babies. The procedure is a simple one. A 3-inch No. 19 or 20 gauge infiltration needle is introduced into the subcutaneous tissue in the kidney region of the back. The needle is inserted deeply and passed up parallel to the spinal column to the sub-scapular region. As the needle is withdrawn, the blood is injected leaving a column of blood almost the length of the back. The needle puncture point is sealed with collodion on a small piece of cotton. Blood is injected on both sides of the midline. If the infant is placed on his abdomen over a small blanket roll so that the back is slightly arched, the blood may be injected with little difficulty.

The feeding schedule is a controversial point among many pediatricians. Some doctors advocate frequent small feedings; others give larger amounts with longer intervals between feedings, The latter method has one important advantage in that it gives the baby more rest. Both methods are successful if used intelligently. At the Minneapolis General Hospital the 4-hour schedule has been used for the last 8 years successfully.

The prematures are divided into three groups according to their weights: the first group is made up of those weighing 1,500 grams (3.3 pounds) or less, the second group includes those between 1,500 grams and 2,000 grams (4.4 pounds) and in the third group are those weighing 2,000 grams or more.

After the 16-hour rest period the first group is offered 10 c.c. (⅓ ounce) of water every 2 hours during the remainder of the first day and thereafter every 4 hours. After the first 24 hours the amount of water offered is increased by 2 c.c. with each feeding until 30 c.c. (1 ounce) are reached, and this amount is continued until the tenth day. After 10 days one ounce is given twice a day at 8:00 A.M. and 4:00 P.M. If the baby has difficulty taking fluids by mouth, the water is discontinued and given subcutaneously.

Milk feedings are begun at the end of the first 24 hours. Beginning with 5 c.c. of breast milk with 2 per cent calcium caseinate (Casec) every 4 hours, the amount is increased by 1 c.c. with each feeding until 50 c.c. (1⅔ ounces) are offered. Further increase in feeding depends upon the progress of the infant. Usually the feeding may be increased from 2 to 5 c.c. per day thereafter. If any regurgitation takes place, the amount is immediately decreased.

The second group is also given 10 c.c. (⅓ ounce) of water at the end of the 16-hour rest period, and this amount is repeated every 2 hours for the remainder of the first 24 hours. Thereafter water is given every 4 hours and with each administration the amount is increased by 2 c.c. until 45 c.c. (1½ ounces) are reached; then decreased by 2 c.c. until 30 c.c. are reached. This is continued until the tenth day. After ten days an ounce of water is given only twice daily as in group one.

Beginning at the end of 24 hours, 10 c.c. (⅓ ounce) of the milk feeding are given. As in group one these feedings are given every 4 hours (at the alternate 2-hour period water is given), increasing the amount by one c.c. with each feeding until 60 c.c. (2 ounces) are reached. Further increase is ordered as the baby demands it which is usually about 5 c.c. per day until 3 or 4 ounces have been reached.

Prematures in the third group are started with 15 c.c. (½ ounce) of water at the end of 16 hours. This amount is given every 2 hours until the end of the first day. Thereafter the water is given every 4 hours increasing with each administration by 2 c.c. until 45 c.c. (1½ ounces) are offered; then decreased by 2 c.c. each feeding until 30 c.c. (1 ounce) are given. At the end of the tenth day 30 c.c. of water are given only twice daily at 8:00 A.M. and 4:00 P.M., just as the first and second groups.

At the end of 24 hours the third group is offered 15 c.c. (½ ounce) of milk feeding. This feeding is given every 4 hours (at alternate hours with the water) increasing the amount

by 2 c.c. with each administration until 45 c.c. (1½ ounces) are given. The amount is then increased by 5 c.c. a day until 75 c.c. (2½ ounces) are reached. Additional increase in the feeding depends upon the progress of the infant. In most cases the feeding can be increased by 5 c.c. daily to 105 c.c. (3½ ounces). Babies weighing over 2,250 grams may require more food than is indicated in the above routine. If the infant will take more formula, the amount may be increased more rapidly.

Little can be expected in the way of weight gain until about 45 calories per pound (90 calories per kilogram) are administered. Later the infant may require as much as 60 calories per pound. Rather than to pay too much attention to total calories, a factor which has in the past been over-emphasized, it is a good plan to feed the premature infant an amount sufficient for an adequate consistent weight gain.

For the sake of clearness, the schedule is presented as follows:

ROUTINE OF FEEDING FOR THE PREMATURE INFANTS

	Milk—c.c.			Water—c.c.*		
	1	2	3	1	2	3
First Day:						
16th hr.				10	10	15
18th hr.				10	10	15
20th hr.				10	10	15
22nd hr.				10	10	15
Second Day:						
1st F.	5	10	15	12	12	17
2nd F.	6	11	17	14	14	19
3rd F.	7	12	19	16	16	21
4th F.	8	13	21	18	18	23
5th F.	9	14	23	20	20	25
6th F.	10	15	25	..	..	..
Third Day:						
1st F.	11	16	27	22	22	27
2nd F.	12	17	29	24	24	29
3rd F.	13	18	31	26	26	31
4th F.	14	19	33	28	28	33
5th F.	15	20	35	30	30	35
6th F.	16	21	37	..	..	..
Fourth Day:						
1st F.	17	22	39	30	32	37
2nd F.	18	23	41	30	34	39
3rd F.	19	24	43	30	36	41
4th F.	20	25	45	30	38	43
5th F.	21	26	50	30	40	45
6th F.	22	27	50	..	..	..
Fifth Day:						
1st F.	23	28	50	30	38	43
2nd F.	24	29	50	30	36	41
3rd F.	25	30	50	30	34	39
4th F.	26	31	50	30	32	37
5th F.	27	32	50	30	30	35
6th F.	28	33	50	..	..	..
Sixth Day:						
1st F.	29	34	55	30	30	33
2nd F.	30	35	55	30	30	30
3rd F.	31	36	55	30	30	30
4th F.	32	37	55	30	30	30
5th F.	33	38	55	30	30	30
6th F.	34	39	55	30	30	30
Seventh Day:						
1st F.	35	40	60	30	30	30
2nd F.	36	41	60	30	30	30
3rd F.	37	42	60	30	30	30
4th F.	38	43	60	30	30	30
5th F.	39	44	60	30	30	30
6th F.	40	45	60	..	..	..
Eighth Day:						
1st F.	41	46	65	30	30	30
2nd F.	42	47	65	30	30	30
3rd F.	43	48	65	30	30	30
4th F.	44	49	65	30	30	30
5th F.	45	50	65	30	30	30
6th F.	45	51	65	..	..	..
Ninth Day:						
1st F.	46	52	70	30	30	30
2nd F.	47	53	70	30	30	30
3rd F.	48	54	70	30	30	30
4th F.	49	56	70	30	30	30
5th F.	50	58	70	30	30	30
6th F.	50	60	70	..	..	..
Tenth Day:						
1st F.	50	60	75	30	30	30
2nd F.	50	60	75	30	30	30
3rd F.	50	60	75	30	30	30
4th F.	50	60	75	30	30	30
5th F.	50	60	75	30	30	30
6th F.	50	60	75	..	..	..

Eleventh Day:

Further increases in feeding depend upon progress made.

F.—Feeding.
1—Prematures 3.3 lbs. (1,500 grams) or less.
2—Prematures 3.3 and 4.4 lbs. (1,500—2,000 grams).
3—Prematures 4.4 lbs. (2,000 grams) and more.

*If specified amount of water cannot be taken orally, give it in small doses, subcutaneously as physiological or isotonic saline.

The feeding most easily assimilated by the premature baby is human milk. The mother should be taught by the doctor or a competent nurse to express her breasts as soon as the milk comes into them. If this procedure is carried out correctly and conscientiously every 4 hours, 5 times in 24 hours, her breasts will stay stimulated and give an adequate milk supply for her baby. If the mother is unable to produce enough milk, an effort should be made to obtain it from some other source at least until the baby weighs 2,500 grams. The milk collected over a period of 24 hours is boiled 1 to 2 minutes and 2 per cent Casec is added to it. The addition of calcium caseinate (Casec) has been found to definitely reduce the number of cases in which frequent liquid stools have developed and has led to a satisfactory and consistent gain in weight. As long as the amounts are graduated,

each feeding should be poured into a separate bottle and labeled with the amount and the time that the feeding is to be given.

Because economic and physical conditions often make it impossible for the physician in a small community to obtain breast milk, scientific investigations have been made with the result that a preparation has been formulated which is an adequate substitute. The observation that premature infants have low values for serum protein during the first 3 months of life led some physicians to experiment with the addition of protein content to the milk feeding for the premature baby. It was finally discovered that the simple fortification of cow's milk with 1 to 3 per cent calcium caseinate gave the most satisfactory results. Extensive studies have been made in the fat metabolism of normal, premature and twin infants. It was found that premature babies did have marked difficulty in fat absorption. There was also striking differences in the ease with which the different fats were absorbed. Olive oil was more completely absorbed than butter fat, and thus when olive oil was substituted for butter fat, there was a more rapid gain in weight. A product containing both calcium caseinate and olive oil was developed. This product (Olac) is made up of skimmed milk solids, calcium caseinate, olive oil, and dextrimaltose. In view of the fact that vitamin A is removed when the cow's milk is skimmed, halibut liver oil is added. Olac with which no doubt a number of you are already familiar comes in powder form. It is simple to prepare: one part of Olac is slowly added to 5 parts of sterile water. In a study made at the Minneapolis General Hospital in which Olac was compared with the breast milk-casec formula and with an evaporated milk formula, it was found that it compared favorably with the breast milk formula in that it was easily assimilated by the infants weighing 2,000 grams (4.4 pounds) or less, and surpassed the evaporated milk formula. As for the larger infants, those weighing over 2,000 grams (4.4 pounds), the group that received Olac made a better showing than either of the other two groups which were fed the breast milk and the evaporated milk mixture. Because of the added cost of this product the babies are often placed on an evaporated milk formula which they can tolerate more easily as they mature. If the premature babies are given Olac until they are the weight of normal newborn babies, it is usually sufficient.

In the presence of loose stools which in our experience is comparatively seldom, 2 per cent Casec added to the Olac, gives a good response.

The evaporated milk formula is made up of equal parts of evaporated milk and sterile water with 3 per cent dextri-maltose. Although it is assimilated less easily than those already discussed, it has given good results especially in the larger premature babies.

Feeding the premature baby is one of the major considerations in the nursing care. Every precaution must be taken to insure cleanliness in the preparation of feeding and fluids, and it is essential that feedings be kept warm throughout the time they are being given. Three methods are commonly employed:

1. The gavage or catheter method is frequently used.
2. A medicine dropper protected by a rubber tip may be used. If correctly employed it is a good method, but it is harder than other methods to teach to the personnel.
3. Bottle feeding is used but conservation of the baby's strength is here to be considered.

Gavage is done to conserve the strength of the very small infant. Too often it is employed only as a time-saving measure. As irritation and injury to the nasal mucosa may result from nasal gavage, the oral route is preferred. Many babies weighing less than 4.4 pounds (2,000 grams) must be fed by catheter. If this is necessary, a No. 10 French catheter is used for small prematures; a No. 12 French catheter for larger prematures. The length of catheter to be passed is measured as the distance from the tip of the ensiform cartilage to the bridge of the nose. It may be marked at this point with silver nitrate. The average length is 4 to 5 inches, which will bring the tip of the catheter just to the cardia of the stomach. The catheter is moistened with water before passage. The sterile catheter or tube is carefully passed by mouth, not allowing it to go beyond the mark. There should be a catheter for each infant. The baby may be supported in a semi-recumbent position, and after becoming quiet is slowly fed. When the procedure is complete, the tube is kinked and removed quickly. The infant is supported in the sitting

position, in the crib, to allow for the expulsion of air. The baby is watched carefully at the time of feeding and for a while after the tube is removed to see if it is going to regurgitate. If regurgitation should occur, the head and shoulders are lowered and the baby is turned face downwards. As soon as the infant has been tube-fed, it is turned to the right lateral position. This nursing care is one of the most important factors in preventing otitis media and bronchopneumonia due to aspiration.

Infants weighing over 4.4 pounds (2,000 grams) may often be fed by medicine dropper which is considered by many to be the method of choice. Patience and care on the part of the nurse are prerequisites to success. Drop by drop the fluid is placed on the dorsum of the tongue, trickles down and is swallowed. To avoid aspiration of feeding it is essential that the nurse support the infant in a semi-sitting position and before replacing him flat on the mattress she must inspect his mouth and throat to determine that all the feeding has been swallowed. Babies usually begin to nurse from the bottle when they approach 5 pounds (2,300 grams) in weight.

Premature babies give signs of vitamin deficiency early in life unless their diets are well fortified with the essential ones. Vitamins aid greatly in the progress of the infants and it is wise not to let more than two weeks elapse before they are added to the diet.

Ten drops of a water soluble antirachitic preparation (Drisdol) may be added twice daily to the formula of the babies weighing less than 2,000 grams (4.4 pounds). One teaspoon of fresh orange juice may also be given twice a day. If the baby does not take fluids well by mouth, the orange juice may have to be given by the gavage method. When the babies reach or are 2,000 grams (4.4 pounds) or more in weight, they may receive Oleum Percomorphum (50 per cent), White's Cod Liver Oil Concentrate, or Viosterol in Halibut Liver Oil. Ten drops of any one of these preparations should be given twice a day in a small amount of orange juice. Cod Liver Oil or concentrates (oily preparations) should not be added to the formula since a large proportion of the oil sticks to the bottle and the nipple. The amount of orange juice can be increased gradually from 1 to 2 teaspoons twice a day.

In connection with feeding, one is faced with three complications common to premature babies. They are persistent regurgitation, vomiting, and diarrhea.

Regurgitation may often be simply corrected by intelligent nursing care, that is by feeding more slowly and carefully, by elevating the baby's head while feeding, or by placing the baby in a semi-sitting position when half the feeding has been taken, and again when it has been completed, to allow the baby to belch. It may be too that the baby is being overfed, and that his spilling over can be corrected by decreasing the feedings temporarily, then slowly increasing after regurgitation has ceased. When vomiting occurs no further increase in feeding should be made. It may actually be necessary to stop the formula for one or two periods, or at least to decrease the volume and increase the number of feedings until the vomiting has stopped. The physician must determine this in each case.

If diarrhea (water stools) occurs, the first and most important consideration must be an increase in fluids. The simplest method of doing this is to give Hartmann's solution by hyperdermoclysis. The formula is discontinued for 1, 2 or 3 feedings, after which they may be resumed by using small amounts of an easily assimilated food, and gradually increasing the volume to requirements. The breast milk-calcium caseinate preparation or Olac with the addition of calcium caseinate are best employed in these cases. Weak tea or one-half strength Hartmann's solution may be given by mouth in the interval when no milk feeding is used. All antirachitic and antiscorbutic therapy should be discontinued while either diarrhea or vomiting exist.

If there is no improvement in the diarrhea, whole blood may be given deep subcutaneously. Intravenous therapy though usually difficult to perform, is most effective in this situation. The Hartmann's solution given by slow continuous administration, about 3⅓ ounces (100 c.c.) to small infants and as much as 6 ounces (200 c.c.) to the larger premature infants, may be repeated daily until the baby is able to take adequate fluids by mouth.

During a siege of vomiting or diarrhea the infant should be weighed daily so that its course may be watched closely. If there is a weight loss, concentrating the breast milk two-thirds

(Continued on Page 70)

HISTORY OF MEDICINE IN DAKOTA COUNTY

(Continued from December issue.)

1890-1900

The cost of the medical attendance on the poor mounted during the nineties. In 1894 the physicians of the county offered to do all of this work for the sum of $1,500. This proposition was refused by the commissioners because it seemed too expensive. Nevertheless a rough estimate of the bills sent in by the individual physicians for that year shows that the county saved, at most, only a few hundred dollars. The following year the total cost was well over $1,700. As a result the county was divided into specific districts, each of which enjoyed the services of a physician at a fixed salary. In this way the total was kept at approximately $1,100 per annum. The districts were as follows: (1) Hastings, Ravenna, Nininger, the north half of Marsham and the east half of Vermillion; (2) New Trier, Hampton, Randolph, Douglas and the south half of Marsham; (3) poor farm, Rosemount, Lebanon, and west half of Vermillion; (4) Lakeville, Eureka, Burnsville, Greenvale, Waterford, Scotia; (5) Farmington, Empire, Castle Rock; (6) South Saint Paul, West Saint Paul, Inver Grove, Eagan and Mendota. Almost every reputable physician at one time or another served in the capacity of county physician.

The position of health officer in Hastings was filled by J. C. Fitch, Peter Schneider, J. J. Schmitz, A. M. Adsit, and H. G. Van Beeck. The third name in the list is that of a veterinary. At the time of his election in 1897 the mayor announced that the salary of the health officer would be $100 for the year "if he attended to his duties." Previously the salary had been less than this. There is nothing to indicate that the health officers were not in the habit of "attending to their duties." They reported births and deaths, saw that the city was cleaned up every once in a while, checked up on the contagious diseases in town, advised the muzzling of dogs, and on several occasions suggested better ventilation and more blankets for the city jail. The reports were usually "accepted and placed on file" by the city authorities.

Members of the pension examining board in the nineties were Dr. J. M. Tucker and Dr. H. G. Van Beeck. Dr. Van Beeck and Dr. J. C. Fitch did most of the examining of the insane in the county.

Among the first and best known of the physicians who opened offices in the county during this decade were Peter Schneider of Hastings, and W. H. Cooke of Lakeville. Dr. A. A. Finch and Dr. A. B. Hawes both practiced in Hastings with their fathers for short periods. Others who came a little later were Drs. R. E. Cavanaugh, Wm. M. Dodge, J. G. Hodgkinson, A. O. Beal, A. G. Phelps, F. H. Ford, Charles Cappellen and C. A. Faulkner. Most of the latter group did not remain in the county

As in the preceding decade the only diseases that affected the community to any extent were scarlet fever and diphtheria. There was a slight alarm caused by the former in November, 1895. As to diphtheria there were a number of cases

almost every year and the toll of deaths, although not long, was, nevertheless, steady. The local health officers showed themselves to be active in quarantining cases and giving instructive lectures. In December, 1899, a special meeting of the Hastings city council was called at the instance of the board of health to devise means of controlling the diphtheria cases in town. The following regulations as printed in the *Hastings Gazette*, December 9, 1899, were adopted:

1. All cases of sore throats reported to the health officer to be temporarily quarantined.
2. All people found endeavoring to evade the law to be prosecuted by the health officer.
3. Three physicians to be engaged to visit the schools daily and all suspicious cases to be temporarily quarantined and a swab taken for examination.
4. These physicians to ascertain the condition of health of all absent children in their respective schools.
5. Health officers to enforce the quarantine according to the law.
6. The three physicians appointed to report daily to the health officer.

While efficient physicians adopted up-to-date theories and methods, many an old-timer in the country continued to practice on the basis of his practical experience, as he had learned little or nothing since he left medical school some thirty or forty years before. Such for example, was Dr. Percival Barton, an able practitioner, but a confirmed enemy of all new theories. It is rather pathetic to find him, as late as 1895, writing an article for the *Northwestern Lancet* in which he assailed the germ theory, maintaining that bacteria are the result and in no case a cause of illness.

Biographies

E. D. Abell came to Farmington about 1878 and practiced there for many years.

Charles Powell Adams, one of the outstanding men of Dakota County, was born in Pennsylvania in 1831. He was of Scotch-English and German descent. At the age of eighteen he began to study medicine with Dr. W. R. Waddell of West Bedford. He also studied in Knox County, Ohio, with Drs. Connelly and Pierce, and graduated from the Ohio Medical College in 1851. The next year he began practice in Indiana but his health was impaired by overwork and an attack of malaria and he moved to Hastings. In 1859, Dr. Adams bought a grocery store which he ran for a number of years and about the same time he began the publication of a newspaper, the *Hastings Democrat.*

In May, 1861, Dr. Adams enlisted as a private in the Dakota County Volunteers and was elected captain of his company. He was promoted the next year to the rank of lieutenant-colonel in the First Minnesota Regiment and in March, 1865, he was made a brigadier-general. We take the following paragraph concerning his war experiences from Neill and Williams' history of Dakota County:

"He was in every battle from the first Bull Run to Gettysburg, and was an unusual sufferer from wounds. His first wound was a slight one in the left groin, at Malvern Hill, July 1, 1862; at Antiatam, September 17, 1862, severely in the left shoulder; at Gettysburg, July 2, 1863, six times, through the left cheek and left lung, in the groin, in the left thigh, breaking the femur, and one in the abdomen. He was left for dead on the field, but was found and cared for by his comrades and was taken to the hospital at Littlestown and thence to Baltimore, Maryland. For eighteen months a crutch was necessary to enable him to walk, and, as relics of the conflict, he carries in his body two bullets and one buckshot."

After the close of the Civil War, Dr. Adams commanded a corps of cavalry and artillery against the Sioux in 1866 and was successful in spite of the heavy snow and cold weather. In 1877 he was elected president of the newly organized Dakota County Veteran Association.

Dr. Adams was a charter member of both the Minnesota State Medical Society (1869) and the Dakota County Medical Society (1870) and held offices in both organizations. He was affiliated with the American Medical Association, attending many of its meetings, an honorary member of the California State Medical Society, a member and ex-president of the Rocky Mountain Medical Society.

Dr. Adams was active in local and state politics and was a member of the Democratic party. In 1856 he was elected a member of the territorial legislature and was appointed chairman of the committee on corporations. He served as mayor of Hastings in 1873 and in 1878 was elected a member of the state senate from Dakota for a four-year term.

Dr. Adams was married three times. He died on his farm in Vermillion in 1893 at the age of sixty-three.

Alfred Adsit was born in 1857. He attended the Detroit Medical College, Michigan, and the Columbus Medical College of Columbus, Ohio, from which he graduated in 1881. After specializing in eye and ear work at the Massachusetts General Hospital of Boston he located in Hastings in 1885 where he remained until his death. In 1908, with Drs. Clark and Wall, he opened a private sanitarium there. He was house physician at the Hastings State Asylum, served on the school board and was a member of the state and national medical bodies. For a number of years he was health officer of Hastings and he also served as county physician.

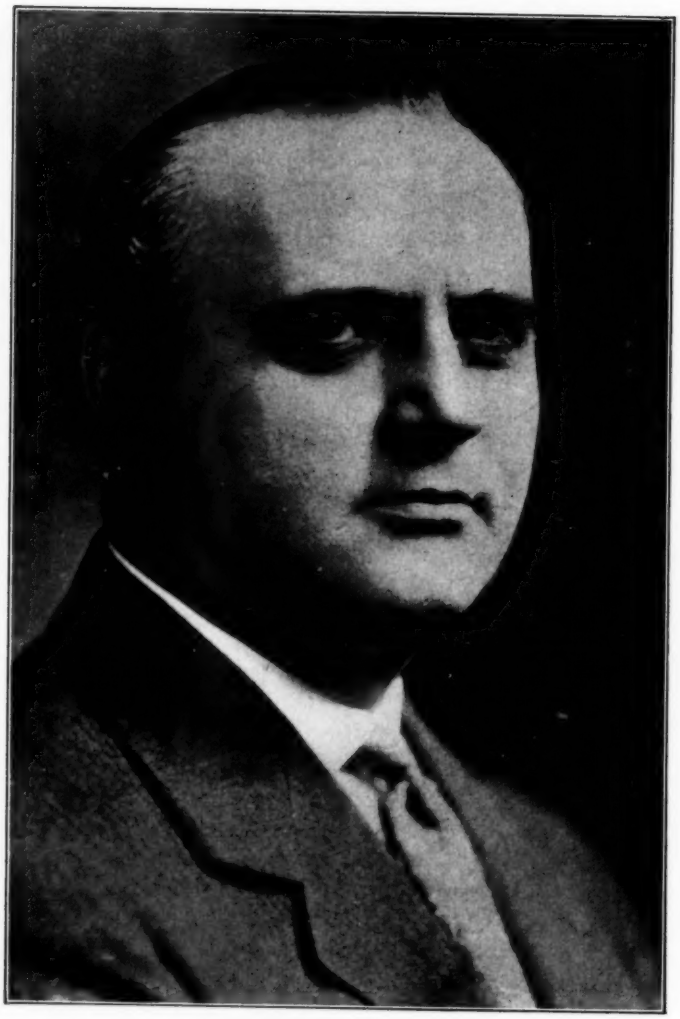
J. L. Armington practiced in Hastings during the sixties and seventies with the exception of several years spent at Northfield, Minnesota, and in Utah. He was a surgeon in the Second Minnesota Regiment during the Civil War.

E. D. (or E. G.) Ault, a graduate of McGill University, Canada, came to Hastings to practice with Dr. J. E. Finch in 1868. About a year later he moved to Dundas, Rice County.

E. D. Ayres came to Hastings in the fifties. The first definite indication of his residence there is the appearance of his card in the *Dakota Weekly Journal* in May, 1856. He was also a wholesale and retail dealer in drugs.

Percival Barton was born in Maine and came to Saint Paul in 1853. Thence he went to Inver Grove where he practiced medicine and also operated a steam saw mill. Subsequently he took up a claim in Waseca County but returned after a year to Inver Grove where he remained. During the war he enlisted with the Seventh Minnesota Volunteer Infantry as assistant surgeon. He graduated from the University of Pennsylvania in 1849 but practiced under an exemption certificate. He served as county physician for a number of terms and he served his immediate locality as justice of the peace. He was an able and sympathetic country practitioner and he also gave much time to business interests.

(To be continued in February issue.)



B. J. Branton, M.D.
President, Minnesota State Medical Association

President's Letter

OUR PLACE IN SOCIETY

TO the men of the medical profession in Minnesota, the new year of 1941 offers another opportunity to be of service to the people of this great commonwealth. At no time in history has it been so necessary to make ourselves cognizant of the vitally important place that we play in the life of the state as well as the economic well-being of the people as the present. We are a part of the people and subject to the same unrest in which they find themselves.

Someone has said that a building is only as strong as its foundation, and again, that a tree can only survive if its roots are deep-seated and strong. So our medical profession has the confidence of the great majority of the people because it has a solid educational foundation, and it has a deep, vigorous root in the affection of the people because of its strength of purpose.

Today we find our profession most necessary to the people, not only those specializing in the various branches of the work, but likewise those who find their places as general practitioners throughout the length and breadth of the state, administering to the individual in all strata of society, the wealthy, the middle-class and the indigent being given no preference.

Where is there another profession so necessary to the present military program, to industry, to sanitation? What other profession can control the health in the schools, both grade, college and university? I ask you, could the health boards or departments, the state sanatoriums, hospitals and penal institutions exist without the medical man? No, we have our place to fill as no other can. We are indispensable to the life of the people.

We must exercise the heritage left us by our predecessors. We must be the leaders, not the followers, in the disseminating of medical lore. We can well afford to coöperate with lay health movements, but should take the initiative by instituting their programs.

The good neighbor attitude should be prevalent in our relationships between ourselves; friendships should be lasting; the words "competitor" and "competition" deleted from our dictionaries.

Our medical world is organized on pure democratic principles. It is a privilege to belong to the American Medical Association, the Minnesota State Medical Association and our County Societies and to be a part of them by exercising our right of franchise, by lending our support to their worthy movements, making ourselves felt in their deliberations, using our officers to carry out our wishes, our committees to do our researches, our state office to help us when questions of procedure arise. While our work is scientific, we must live under and submit to economic laws.

We cannot stand still. American initiative will not allow it. Let the New Year be our opportunity to build our place in society to greater heights.

B. J. BRANTON, M.D., *President*
Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

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Annual Subscription—$3.00 Single Copies—$0.40
Foreign and Canadian Subscriptions—$3.50

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Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

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BUSINESS MANAGER
J. R. BRUCE

Volume 24 JANUARY, 1941 Number 1

THE NEW YEAR

WHAT 1941 holds for America is predictable only in part. The new year will see considerable disturbance in the routine of affairs, both economic and medical. Thousands of individuals cannot be uprooted and transplanted to other localities and occupations without disturbing the usual placidity of life. The enormous expansion of military and manufacturing organizations incident to preparedness plans will necessarily be accompanied by some confusion due to inexperience. We may as well face the fact that there will be some individuals who for various reasons will not step in line. Perhaps lack of coöperation will be more in evidence than if we were actually at war. Public opinion in a country at war tolerates no shirking. There is not as strong an urge in a preparedness campaign for a war that possibly may not materialize. We have had a valuable example in France, however, of a country not united in its defense program, although she knew her neighbor was working overtime to build up its war machine. The unions of France would not lengthen their weekly work schedule. France is paying the penalty now and is learning that there are things worse even than war.

Japan's alliance with the Axis countries and Russia instead of intimidating the United States as intended, only made very evident the need for defensive armament on a large scale. An important question for us to decide in the near future will be whether we prefer to meet this foreign combination at some future date, possibly alone, or at an earlier date in alliance with a powerful empire. We are not prepared to take either step at present and the need for a vigorous preparedness campaign is only too apparent. Production so far has not met expectations and needs.

The medical profession has its part to play in preparedness. It is clear that this should be the main job for the medical profession in 1941 and that all matters such as government suits and agitation for changes in the fundamentals of medical practice should be indefinitely postponed.

THE NATIONAL PHYSICIANS' COMMITTEE

THE National Physicians' Committee is beginning its second year of life. Over 8,000 physicians over the entire country have contributed to its support. It is doing a most important work in educating the public as to the achievements of medicine and the advantages of the present form of medical practice. It is essential to counteract undesirable propaganda for state control of medicine. This committee has objectives in influencing the public similar to those of our state association through the work of its various committees on legislation, public health, interprofessional relations and radio, but it is approaching them differently and on a nation-wide scale. It is doing work that the American Medical Association cannot do and maintain

the status under which it has operated since its organization some ninety years ago.

The following facts serve as a portrayal of the work done by the committee during its first year of existence:

1. Speeches at twenty state medical association meetings.
2. Approximately 500 county medical meetings.
3. The encouragement of physicians to appear as speakers at meetings of Chambers of Commerce, Rotary, Kiwanis, and other luncheon clubs, women's organizations and on local radio broadcasts.
4. Two double-truck advertisements in the *Saturday Evening Post.*
5. Approximately fifty full-page newspaper advertisements (These were placed under local sponsorship.).
6. The distribution of approximately 1,092,000 letters and more than 2,000,000 booklets and other printed matter.

We believe that a firm foundation has been laid for further progress. The influence exerted by the National Physicians' Committee is evidenced by what President Roosevelt stated at the dedication of the National Institute of Health, at Bethesda, Maryland. He said:

"Neither the American people nor their government intend to socialize medical practice any more than they plan to socialize industry. In American life the family doctor, the general practitioner, performs a service which we rely upon and trust.

"No one has a greater appreciation than I of the skill and self-sacrifice of the medical profession. And there can be no substitute for the personal relationship between doctor and patient which is a characteristic and a source of strength of medical practice in our land."

The great basic need, that of a liaison with the public has never been more pressing and important than it is at this time. Preservation of the pattern of American Medicine is dependent on the wider knowledge on the part of the public of the problems, methods, aims, and practice, and, to the extent possible, the philosophy of American medicine under our system of independent practice.

With proper support by the physicians of the country, the National Physicians' Committee, in conjunction with the A.M.A. and the component state medical associations, is in a position to be of great influence and to lay before the American people the ideals of American medicine, and what American medicine has accomplished.

Eleven and four-tenths per cent of the doctors of Minnesota, or a total of 351 individuals, have contributed toward the support of the national committee during the past year. It is of interest to note the percentage of contributing doctors in the following states:

Arizona—13 per cent
Idaho—15 per cent
Montana—12 per cent
Nebraska—10 per cent
Nevada—12 per cent
North Dakota—15 per cent
Oregon—13 per cent
Utah—16.5 per cent
Washington—17 per cent

There is no reason why Minnesota should not head this list in 1941.

This is an appeal to the physicians of Minnesota to contribute in 1941 as liberally as possible toward the support of this committee. This committee is depending on you and earnestly seeks your aid. Checks should be made out to Dr. N. S. Davis, III, and mailed to him at the Pittsfield Building, Chicago, Illinois, in care of the National Physicians' Committee.

F. J. SAVAGE† and W. F. BRAASCH*

Correction.—In the editorial entitled "The Blood Bank" published on page 870 of the December issue of MINNESOTA MEDICINE, the authors should have appeared as Dr. J. S. Lundy and Dr. Thomas H. Seldon. Through a typographical error, Dr. Seldon's name was misspelled in the final printing.

STATE MEETING

The annual meeting of the Minnesota State Medical Association will be held at the Saint Paul Auditorium May 26, 27 and 28, 1941.

The committee on Scientific Assembly consists of Dr. O. W. Holcomb, Saint Paul and Dr. A. N. Collins, Duluth, surgical section; Dr. H. C. Habein, Rochester and Dr. W. H. Aurand, Minneapolis, medical section; Dr. J. W. Gamble, Albert Lea and Dr. W. H. Hengstler, Saint Paul, specialties. Dr. F. W. Lynch, Saint Paul, is in charge of local arrangements.

One afternoon will be devoted to medical phases of the national defense program.

The popular Round Table luncheons will be held Monday and Tuesday.

†Chairman, Minnesota Division, National Physicians' Committee.
*Acting Secretary and Member Board of Trustees, National Physicians' Committee.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

MEDICAL ECONOMICS IN MINNESOTA
1934-1941

After eight years of service to the Committee on Medical Economics as chairman and as editor of this section of MINNESOTA MEDICINE, Dr. W. F. Braasch of Rochester this year resigned his post to devote himself to the heavy and exacting duties of trustee to the American Medical Association. As an officer for many years of the Minnesota State Medical Association and particularly as chairman of this committee, Dr. Braasch has won nation-wide recognition for himself, for the work of the Committee and for Minnesota.

The occasion of his retirement would be one of great regret and great loss to Minnesota if it were not for the fact that he retains membership in the committee and his interest in its work is certain to remain close and loyal. His duties as trustee will keep him in close touch with economic and social developments in medicine all over the country and his advice and assistance will undoubtedly be willingly given to his colleagues in Minnesota.

When the Committee on Medical Economics was formed in 1934 federal relief for the unemployed was new, Social Security was only a phrase and the concept of federal grants-in-aid for health programs in the states was still strange and unfamiliar.

It was evident to forward-looking physicians, even then, that new currents were moving in the United States and that medicine would inevitably be drawn into the main stream of a new government paternalism unless a strong, wise and farseeing resistance could be set up.

Subsequent years have seen that resistance develop and flourish. And it is due to the work of men like Dr. Braasch of Minnesota that the government still pauses well on this side of an invasion of the private practice of medicine and that its spokesmen are still loud in praise of the fundamental principles for which medicine in America stands—maintenance of high standards for education and practice, freedom from political control for the doctor and freedom of choice for the patient.

It is difficult for any of us to think back clearly, now, to that remote date of 1934. We are separated from it by more than years. The face of the world has changed since then and attention in the United States has shifted over night from social reform to a feverish preparation for the cataclysm of war which may at any time spread from Europe and Asia to the American continents. Wars are not eternal, however, even when they go on for thirty years or even for 100 years. In the end there is a breathing space. But what will be left of the practice of medicine as we know it now in the United States when that breathing space comes?

It is for the American physician to say. Only he is keenly aware of the medical values which may easily be sacrificed with a mere scratch of a defense coördinator's pen in the heat of a national emergency. Only he whose whole heart and mind are bent upon healing can be trusted to cherish and protect the future of scientific medicine in this period of convulsion and attack.

Thanks to our alert profession in Minnesota, to our watchful and farsighted Committee on Public Policy, our fine State Board of Health and to Dr. Braasch and his committee, Minnesota today stands at the top among the states in medical achievement, in the public health, in its relative freedom from quackery in medicine and in the absence of radical and dangerous legislative tampering with the practice of medicine.

To hold the place we have won and to meet the heavy new responsibilities of the future is the task we must assume today. No one committee can do it; but if all of us work together for the common good, the task will be done.

FOR RESERVE OFFICERS IN MINNESOTA

Problems of medical reserve officers are varied and difficult. Official information on what the reserve officer may expect in the way of advance notice before he is called to active duty—about protection on active duty—about possible safeguards for the practice he leaves for the term of that service—is not always easy to secure and sometimes it seems to be contradictory and uncertain.

The following information has been verified by the Committee on Military Affairs and may be relied upon, subject to emergency changes in regulations always possible in view of the unsettled international situation and defense needs at home.

"With or Without Consent"

1. Under the recent joint resolution passed by the 76th Congress, the President is authorized to order into active military service of the United States for a period of twelve consecutive months each, any or all members of any Reserve component of the Army of the United States with or without their consent, to such extent and in such manner as he may deem necessary for the strengthening of the national defense. If a sufficient number of officers do not indicate their availability, reserve officers must necessarily be ordered to duty. The oath of office taken by each member of the Reserve Corps is regarded as binding and will be taken at its face value in lieu of advance notice if the member is needed.

2. Corps area surgeons have been urged by the Surgeon General of the Army and the Committee on Medical Preparedness to avoid, if possible, stripping any community of needed medical service; but military needs come first and it is inevitable that civilian considerations will receive smaller attention.

Urged to Volunteer

To reduce as far as possible the number of reserve officers who must be called without their consent, all interns and residents are being urged to volunteer at once for a year of service. To do so may save them an interruption to their practice later on. Definite arrangements are being worked out whereby some medical school graduates may be assigned to service in a military hospital and this service may count toward certification for an examining board since, within the next three months, about 20,000 additional military hospital beds will be opened and physicians will be needed to man these military hospitals.

3. Reserve officers should forward their physical examination records to Corps Area Headquarters before they are called to active duty. Not a few have been discovered unfit for service after they had left their practices and made extensive arrangements to be absent for a long period of time.

4. The War Department will not accept any resignations from officers in the Reserve Corps who are above the rank of a captain, regardless of reasons, unless specifically authorized by the Secretary of War. Those who are below the rank of captain may resign if they have persons dependent upon them and their resignations may or may not be accepted according to the circumstances and the need.

5. Pay and allowances are presented in the following chart:

PAY AND ALLOWANCES

Grade	Annual Base Pay	Monthly Allowances: Rental Allowance, With Dependents	Monthly Allowances: Rental Allowance, Without Dependents	Monthly Allowances: Subsistence Allowance (30 days), With Dependents	Monthly Allowances: Subsistence Allowance (30 days), Without Dependents
Colonel	$4,000	$120.00	$80.00	$36.00	$18.00
Lieut. Colonel	3,500	120.00	80.00	54.00	18.00
Major	3,000	100.00	60.00	54.00	18.00
Captain	2,400	80.00	60.00	36.00	18.00
First Lieutenant	2,000	60.00	40.00	36.00	18.00

6. The annual base pay is increased at the rate of five per cent thereof for each three years of service up to thirty years. Full time will be computed for all periods during which men have held commissions as officers in the Army, Navy Marine Corps, Coast Guard, Coast and Geodetic Survey and Public Health Service or in the National Guard, Naval Militia and National Naval Volunteers or the Naval Reserve Force or Marine Reserve Force when confirmed in grade and qualified for all general service and with full time for all periods during which they have performed active duty under Reserve Commissions and with one-half time for all other periods in which they have held Reserve Commissions.

7. The Order to active duty places the recipient on duty immediately upon receipt and he must report on the date set to the post, camp or station for duty. Travel allowance will be made at the rate of eight cents a mile based on the shortest usual railway route to the station. The trip may be made by automobile but no special delay will be granted on that account.

8. Transportation for dependents will not be furnished by the government and reserve officers are warned that the housing problem at or within the vicinity of Army stations is likely to be acute so that it will probably be advisable to leave the family at home. In some cases, families of officers are definitely forbidden to follow them to their posts.

9. Uniforms and military equipment may be purchased at the first station.

In Case of Injury

10. Injury received or disease contracted in line of duty will entitle the reserve officer on active duty, to hospitalization, medical and surgical care and regular pay and allowances up to six months after the prescribed tour of duty and to necessary hospitalization, medical care and subsistence as long as necessary if the injury or illness requires it for a period longer than six months. The same allowances apply to injury incurred in travel to and from the station.

11. In case of death or disability in line of duty when ordered to active duty for a period in excess of 30 days, the reserve officer is entitled to the same pensions, compensations, retirement pay and hospital benefits as a regular army officer of the same grade and length of service.

12. The reserve officer ordered to active duty (except for training) is entitled to all the benefits of the pension laws existing at the time.

Regular Army Appointments

13. Appointments in the Medical Corps of the Regular Army will, in all probability, continue as at present through competitive examinations of reserve officers who have not passed the age of 32 years at the time of appointment.

For medical reserve officers, as for men selected in the draft, the law provides protection against foreclosure on real estate and other civil suits while they are on active duty, against loss of equipment or other articles purchased previously on the installment plan—though the law does not annul the obligation itself—and against eviction for non-payment of rent provided the rental is not more than $80.00 and the premises are used chiefly for a dwelling place for family or dependents. No protection is provided in the law against eviction from premises used for offices, but all reserve officers and any others who may be called to service are advised to make special arrangements, immediately, with landlords looking to their possible absence on duty. Such arrangements have already been made by a number of real estate and rental firms in Minnesota for convenience of physician tenants. In St. Paul, for example, the management of one large building has announced that offices of physicians and dentists called to active duty will be closed and left exactly as they are for a nominal rental, $5.00 a month, for the period of their absence from practice. Similar arrangements can undoubtedly be made elsewhere.

Minnesota Plan

No law can protect against loss of practice, of course, but many state medical associations have developed a variety of plans for keeping intact the practice of members called to active duty. Some of these plans seemed elaborate and unworkable to the Committee on Military Affairs, which studied the matter. A simpler plan was accordingly presented to the Council, at its meeting on December 15, for Minnesota. This plan was approved and is already being put into effect.

It calls for creation of a special list or "pool" of physicians who are not immediately eligible

for military service and who can be sent on locum tenens to act as substitutes for physicians called for military service.

The first step in the program will be a special plea to all reserve officers, regardless of their situation, and even if they have already asked for deferment, to make all possible preparations now for a call to duty.

The need for medical officers is acute. No requests for deferment will be heeded by the War Department unless they are given for grave reasons. The reserve officer may be called with very short notice or no notice at all if the need is urgent.

For those who are unable to make their own arrangements the list to be created by the Association will fill the gap.

To procure the names for this list a canvass of the entire Association is already under way. Letters have been sent to every member, to interns, residents and fellows and to all affiliate members of the Association urging all who are willing to accept a locum tenens under these circumstances to send their names immediately to the State Office.

Contract to Be Drawn

For many young men just entering practice and for many older men who are retiring from active practice this "pool" of names may afford a welcome opportunity for service.

A contract will be drawn up with the advice of the legal counsel of the Association to protect the interests of both, in case a man is sent from the "pool" to substitute for a medical officer called to duty.

For Relief from Dues

The question of whether dues of members going into the service should be remitted was also discussed at length by the Council at the December meeting. It was generally agreed by the Councilors that no members could be relieved entirely of the obligation of paying dues to the state society for two reasons: first, the constitution and by-laws of the Association make no provision whatever for retaining members on that basis; second, heavy drains are anticipated on the state budget and funds could not be spared for the purpose, even if the time-consuming process of changing the by-laws were undertaken, this year.

It was suggested, however, that members who remain in practice at home will almost inevitably benefit to some extent from the absence of men in service and they will undoubtedly be glad to pay the dues of absent colleagues as their contribution to defense.

Meetings to Be Called

Indeed, it was reported that some societies have already decided to pay both local and state society dues for their members on active duty out of society funds.

At the direction of the Council, therefore, a letter has already gone to all officers of local and district medical societies asking them to call a special meeting of their societies to act upon this matter. In smaller societies where funds are limited, it was suggested that members might be assessed for the amount necessary to pay these dues.

The number of reserve officers so far called is relatively small and, though more will be called before July 1, the amount of money required from each society will not, it is believed, be excessive.

Membership Important

Many reserve officers, particularly those holding commissions in the higher grades, will not need or desire relief from payment of medical society dues. All, however, will want to retain membership, not only to maintain their own position at home and the position of their organization, but also to enjoy privileges of membership wherever they may be stationed. It is also an established fact that the War Department attaches great weight to medical society membership and takes it into account in making all appointments and promotions in the medical services.

NEW YEAR'S RESOLUTION

(Monthly Editorial Prepared by the Medical Advisory Committee)

With the advent of 1941 your Medical Advisory Committee is impelled again to put before you clearly the importance of keeping accurate records. There is no single item more important in defense of an unjust malpractice suit than a well-kept clinical record. Whether treatment is carried on in the office, or in the hospital, it is your important duty to put in writing the treat-

ment administered, and the advice given to the patient. Particularly important is a notation, in your own handwriting, of the directions you give a fracture care, or a post-operative case, when it leaves your immediate care.

A careful notation as to the condition of the specific ailment, when the patient leaves your hands, may save embarrassment and trouble later. You are busy. You cannot be expected to remember the details of any individual case, and if you are called upon suddenly to defend yourself in a malpractice suit a well-kept clinical record, including dates, will prove a great help.

In hospital cases be sure to have a notation on the chart, in your own handwriting, if there is any unusual occurrence. If a patient falls out of bed; if there is a complaint about a hot water bottle; if there is a minor infection of some kind, and if there is any evidence at any time of anything other than the expected course of events, make a note of it, with the date, on the Progress Record of the hospital chart.

When the patient leaves the hospital make a notation, in your own handwriting, of the condition on discharge, and the instructions given. Do this yourself; do not rely upon the intern or the house physician to do it for you. This will save time and trouble as to identification of the record if it ever has to be taken into Court.

Your Advisory Committee is not pessimistic. It believes that medicine and surgery, as practiced in Minnesota today, are of the highest type. Unfortunately, however, no one of us is immune to unjust malpractice suits, and, therefore, it behooves all of us to keep accurate and complete records, which may be of inestimable help in time of trouble.

Let this be an important New Year's Resolution for 1941!

W.H.H.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Former Minneapolis Chiropodist Pleads Guilty to Practicing Healing Without a Basic Science Certificate

Re: State of Minnesota vs. Clayton E. May.
Re: State of Minnesota vs. Otto A. Burger

On December 6, 1940, Otto A. Burger, fifty-five years of age, entered a plea of guilty before Judge Luther W. Youngdahl of the District Court of Hennepin County, to an information charging him with the crime of practicing healing without a Basic Science Certificate. Burger was sentenced to a term of 3 months in the Minneapolis Workhouse, which sentence was stayed for a period of one year upon condition that Burger return to the State of California, where he was living at the time of his arrest. Burger was indicted jointly with Dr. Clayton E. May by the Grand Jury of Hennepin County on April 27, 1937, charged with manslaughter in the first degree following the death of a 25 year old married woman on whom, it was alleged, a criminal abortion had been performed. The authorities were unable to apprehend either defendant at the time. However, in 1938, the defendant May was arrested in San Francisco, California, charged with murder in the second degree following an alleged abortion on a married woman. May was convicted at San Fancisco, and on October 29, 1938, was sentenced to a term of 5 years to life for that crime. Burger was apprehended in California in the summer of 1940, and returned to Minneapolis for trial. The facts in the case indicate, however, that the abortion was actually performed by the defendant May and that Burger acted simply as a go-between, and made the arrangements for the criminal abortion, and suggested certain medication for the deceased.

Burger was a licensed chiropodist in Minnesota from 1917 to 1936, at which time his chiropody license was revoked for non-payment of the annual registration fee. Burger has never been licensed in Minnesota as a physician although he attempted, without success in 1927, to secure a Basic Science Certificate by exemption, claiming at that time, that he was a naturopath. The defendant May was formerly licensed to practice medicine in Minnesota. On May 23, 1934, he was convicted in Federal Court in St. Paul of "conspiring to harbor and conceal a fugitive from justice, the said fugitive being one John Dillinger." For this Dr. May was sentenced to two years in the Federal Penitentiary at Leavenworth. On February 9, 1935, Dr. May's license to practice medicine in the State of Minnesota was revoked.

License of Minneapolis Physician Suspended for Three Years

In the matter of the revocation of the license of Lewis Van Deboget, M.D.

On December 12, 1940, the Minnesota State Board of Medical Examiners suspended, for 3 years, the license to practice medicine held by Lewis Van Deboget, M.D., of Minneapolis. Dr. Van Deboget was charged with having procured, aided and abetted a criminal abortion upon a married woman. At the hearing, Dr. Van Deboget denied the charge, but a statement signed by Dr. Van Deboget on July 1, 1940, at the time of his arrest, was introduced in evidence. In this statement Dr. Van Deboget admitted that he had been paid $50.00 by the husband of the woman, and upon being asked what method he used to induce the woman to abort, he stated:

"I painted the womb with iodine—the outside of the neck of the womb."

The statement also showed that upon being asked why he painted the womb with iodine, Dr. Van Deboget replied:

"It would cause the womb to contract and cause it to expel anything that was in it."

Evidence was also introduced at the hearing indicating that Dr. Van Deboget had performed other abortions. Dr. Van Deboget's case was submitted to the grand jury of Hennepin County in July, 1940, but the grand jury did not indict him.

Dr. Van Deboget's license was suspended on a previous occasion for a period of 3 months because of the issuance of over 4,000 non-bona fide medical prescriptions calling for alcohol, whiskey and other alcoholic beverages. This suspension occurred on July 6, 1938.

Dr. Van Deboget was born at Grass Lake, Michigan,

in 1874, and graduated from Hamline University in 1909. He was licensed to practice medicine in Minnesota by examination in the same year. Until recently Dr. Van Deboget's office was at 1032 2nd Ave. S., Minneapolis.

License of International Falls Physician Suspended for Five Years for Drug Addiction

In the matter of the revocation of the license of Robert F. Werner, M.D.

The medical license of Dr. Robert F. Werner of International Falls, Minnesota, was suspended for five years on December 12, 1940, by the Minnesota State Board of Medical Examiners. Dr. Werner's license was suspended because of his habitual indulgence in the use of narcotic drugs.

A joint investigation of Dr. Werner's activities, conducted by the Federal Bureau of Narcotics, and the Minnesota State Board of Medical Examiners, disclosed that between June 8, 1938, and June 8, 1940, Dr. Werner had purchased an excessive amount of narcotic drugs. Notwithstanding an unusually large dispensing record, Dr. Werner had a large shortage. He finally admitted that he had diverted a portion of his supply of morphine to his own personal use, which average from 3 to 6 grains daily. Dr. Werner's narcotic record for the period of June 8, 1938, to June 8, 1940, is as follows:

Drug	Bought	Disp.	On Hand	Shortage	
M. S. ¼ gr.	12000	4260	53	7687 — (¼)	
M. S. ⅛ gr.	10900	4970		5930 — (⅛)	
M. S. ⅛ gr.	7100	2840		4260 — (⅛)	
M. S. with atrop. ⅛ gr.	360	318		42 — (⅛)	
Cod. ¼ gr.	4300	4028		272 — (¼)	
Cod. ½ gr.	2100	1874		226 — (½)	
	36760	18290	53	18417	(Tab.)
				3634	(Gr.)

Dr. Werner's record also showed that between July 8, 1934, and November 14, 1936, he was a voluntary patient on 4 occasions at the Willmar State Hospital. Dr. Werner's hospitalization on those occasions was due to excessive indulgence in alcoholic beverages. Dr. Werner was born on April 4, 1901, at Center City, Minnesota. He was graduated in Medicine from the University of Minnesota in 1926, and was licensed in Minnesota by examination the same year.

Minneapolis Physician's Plea for Pardon Denied

Re: State of Minnesota vs. William M. Chowning, M.D.

On November 29, 1930, the Minnesota State Board of Pardons denied a pardon to Dr. William M. Chowning of Minneapolis. Dr. Chowning was convicted on April 24, 1936, by a jury in the District Court of Hennepin County of the crime of abortion. On November 7, 1936, his license to practice medicine was revoked by the Minnesota State Board of Medical Examiners.

The State Board of Pardons conducted a full hearing in the matter on July 29, 1940, and subsequently thereto. At the hearing before the Pardon Board Mr. L. J. Lauerman of Olivia, Minnesota, representing Dr. Chowning, stated that Dr. Chowning "was framed." Mr. Lauerman, claimed that Dr. Chowning's trouble arose out of his testifying in malpractice suits against members of the American Medical Association and the Minnesota State Medical Association. Dr. Chowning's pardon application was opposed by the Minnesota State Board of Medical Examiners for the reason that the facts in Dr. Chowning's case show that he was indicted by the grand jury of Hennepin County for the crime of abortion and subsequently tried and convicted by a jury in the Court of Judge Montgomery. The records of the Minnesota State Board of Medical Examiners show that Dr. Chowning's license was revoked because of his conviction of a felony, the felony being the crime of abortion.

The members of the Minnesota State Board of Pardons are: Governor Harold E. Stassen, Chief Justice Henry M. Gallagher of the Supreme Court of Minnesota, and Attorney General J. A. A. Burnquist.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON NOVEMBER 8, 1940

October Examination

Aita, John Andrew—U. of Iowa, M.D. 1937, Rochester.

Albers, George Donald—U. of Mich., M.D. 1939, Rochester.

Anderson, Charles Duncan—U. of Western Ont., M.D. 1939, Rochester.

Anderson, Earl Melvin—U. of Minn., M.B. 1940, Minneapolis.

Arling, Philip Arthur—U. of Minn., M.B. 1940, Saint Paul.

Bratholdt, James Wollard—U. of Minn., M.B. 1938; M.D. 1939, Minneapolis.

Brown, Murray Hunter—Yale U., M.D. 1938, Rochester.

Brown, Schuyler Pillsbury—U. of Minn., M.B. 1940, Minneapolis.

Burnham, Wesley Howard—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.

Carryer, Haddon McCutcheon—Northwestern, M.B. 1938; M.D. 1939, Rochester.

Catinella, Paul Joseph—Tufts Univ., M.D. 1936, Rochester.

Dahlstrom, Doris Elizabeth—U. of Minn., M.B. 1939, Minneapolis.

Davies, Louis Tookey—U. of Neb., M.D. 1939, Rochester.

Ehni, George John—Northwestern, M.B. 1939; M.D. 1940, Rochester.

Fenstermacher, Richard Henry—Jefferson Med. Col., M.D. 1937, Rochester.

Geissler, Gerald George—U. of Minn., M.B. 1939; M.D. 1940, Hinckley.

Glomset, Daniel Anders—U. of Chicago, M.D. 1938, Rochester.

Hallenbeck, George Aaron—Northwestern, M.B. 1939; M.D. 1940, Rochester.

Hartig, Marjorie Eunice—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.

Higginson, John Francis—Columbia P. & S., M.D. 1937, Rochester.

Honke, Richard Wunnibald—Creighton U., M.D. 1938, Proctor.

Iverson, Rolf Marshall—Northwestern, M.B. 1937; M.D. 1939, Rochester.

Janssen, Martin Ernest—Rush Med. Col., M.D., 1939, Saint Paul.

Judd, David Berkman—U. of Minn., M.B. 1939; M.D. 1940, Rochester.

Kelly, John Francis—U. of Minn., M.B. 1940, Saint Paul.

Leveroos, Edward Herbert—U. of Minn., M.B. 1940; M.D. 1940, Superior, Wis.

Lofsness, Stanley Vincent—U. of Minn., M.B. 1938; M.D. 1939, Minneapolis.

Luckey, Clarence Andrew—U. of Neb., M.D. 1939, Rochester.

Lyman, Richard Watson—U. of Ore., M.D. 1939, Rochester.

Nelson, Clayton Everett Jonas—U. of Minn., M.B. 1940, Saint Paul.

Olson, Stanley William—U. of Ill., M.D. 1939, Rochester.

(Continued on Page 51)

OF GENERAL INTEREST

Dr. and Mrs. Charles E. Rea of Saint Paul announce the birth of a daughter, Mary Virginia, November 20.

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A son, Michael, was born to Dr. and Mrs. William A. O'Brien of Minneapolis, December 1.

* * *

Dr. and Mrs. Francis Lynch are the parents of a daughter, Mary Adeline, born December 11.

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A daughter was born to Dr. and Mrs. Ralph Rossen of Hastings, December 10. She has been named Fredericka.

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Dr. E. A. Thayer of Truman announces the opening of a hospital there. The hospital, a remodeled and modernized residence, has eight beds and three bassinets.

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The marriage of Dr. A. L. Vadheim of Tyler and Mrs. Gladys Donovan took place in Tyler, November 13.

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Dr. George E. Fahr, professor of medicine at the University of Minnesota Medical School, is recuperating after an appendectomy.

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Twin daughters were born to Dr. and Mrs. Alex A. Kugler of Saint Paul, November 27. They have been named Margaret Elizabeth and Patricia Ann.

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Dr. Maud M. Gerdes is now full-time Director of Maternal and Child Health of the Mississippi State Board of Health at Jackson, Mississippi.

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Dedication of a new addition to St. Olaf Hospital in Austin, Minnesota, took place December 1. The 45-bed addition gives Austin a 105-bed hospital.

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Dr. and Mrs. Wallace P. Ritchie of Saint Paul have returned from a month's vacation trip in southern California.

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Dr. R. D. Hanover of Littlefork has taken over the practice of Dr. David M. Potek at International Falls, the latter having been called for active duty in the United States Army.

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Dr. and Mrs. A. E. Benjamin of Minneapolis spent the Christmas holidays in Miami, Florida. They were accompanied by their daughter, Alice, who teaches at Hillsdale School in Cincinnati, Ohio.

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Dr. H. B. Macey and Dr. H. Waltman Walters of Rochester attended a meeting of the Southern Surigcal Association in Hot Springs, Virginia, December 10, 11 and 12.

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Dr. Viktor O. Wilson of the Minnesota State Department of Health will address the Women's Auxiliary of the Minnesota State Dental Association at its annual meeting in February.

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Dr. Arthur C. Skjold is the newly elected president of the Minneapolis Pistol and Revolver Club. Dr. Skjold held the Minnesota civilian pistol championship in 1936.

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Dr. William R. Bagley of Duluth was elected a member of the board of the Minnesota chapter, Izaak Walton League, at its annual convention in Minneapolis which closed December 13.

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Recently elected chiefs of staff of Minneapolis hospitals are: Dr. Duma Carroll Arnold, Asbury Hospital; Dr. Walter Edward Camp, Northwestern Hospital; Dr. Carl Ragnar Wall, Deaconess Hospital.

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Dr. L. A. Nash, who recently completed his fellowship in radiology in the Mayo Foundation at Rochester, is now radiologist at St. John's Hospital in Fargo, North Dakota.

* * *

Drs. M. O. Henry and E. T. Evans of Minneapolis entertained the Minnesota-Dakota Orthopedic Club at a banquet at the Minneapolis Club, December 20, for Dr. Wallace Cole of Saint Paul, who is leaving shortly to take charge of the American Hospital in Britain.

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Dr. Leo G. Rigler, professor of radiology at the University of Minnesota, was toastmaster for the annual banquet of the Twin City Society of X-Ray Technicians, held December 14 at the Curtis Hotel in Minneapolis.

* * *

Dr. M. J. Lindahl has moved into his new hospital-residence in Sherburn. Of colonial style architecture, the building has eleven rooms on the first floor, including living quarters and consultation rooms. It is 77 by 34 feet.

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Among medical courses to be held at the Center for Continuation Study is one in Hospital Administration, January 27 to February 1. Dr. Arthur C. Bachmeyer, director of University Clinics at the University of Chicago, will participate.

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Dr. William B. Castle of Boston, professor of medicine at Harvard Medical School, will participate in the course in Internal Medicine to be given at the Center for Continuation Study on the University of Minnesota campus, March 3-5.

* * *

In Chicago, November 30, for a meeting of the Travel Club of the Central Association of Obstetricians and Gynecologists were Dr. L. M. Randall and Dr. A. B. Hunt of Rochester, and Dr. Claude J. Ehrenberg and Dr. John L. McKelvey of Minneapolis.

Dr. Harold O. Peterson, instructor in radiology at the University of Minnesota Medical School, has entered into practice with Dr. John P. Medelman and Dr. Edward Schons, 572 Lowry Medical Arts Building, Saint Paul.

* * *

Dr. Evelyn Johnson of the Human Serum Laboratory at the University of Minnesota has opened offices in St. Louis Park for the practice of pediatrics. She will continue as clinical instructor in the Department of Pediatrics.

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Dr. C. D. Creevy, assistant dean of the University of Minnesota Medical School, addressed the meeting of the New York Academy of Medicine in New York City, December 18. His subject was "Urinary Calculi Produced by Bacillus Proteus."

* * *

Dr. Charles G. Sutherland of Rochester was elected librarian of the Radiological Society of North America at the organization's meeting in Cleveland. Attending from Minneapolis were Drs. Annette Stenstrom, Leo G. Rigler and C. N. Borman.

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Dr. M. H. Manson, one-time member of the Department of Surgery at the University of Minnesota Medical School and son of Dr. Frank M. Manson of Worthington, became medical director of Bell Telephone Laboratories in New York, November 1.

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Dr. J. Y. Feinstein of Cambridge has opened offices in Grove City, Minnesota. For the past two years, Dr. Feinstein has been senior physician at the State Hospital in Cambridge, and previous to that he practiced at Minot, North Dakota.

* * *

Dr. E. J. Nelson was elected president of the City Hospital staff at Owatonna at a recent meeting. Dr. J. F. Schaefer of Owatonna showed surgical motion pictures prepared by the Northwestern University Medical School.

* * *

Professor R. G. Gustavson, chairman of the Department of Chemistry at the University of Colorado, lectured at the University of Minnesota Medical School, December 12, under the auspices of the Division of Physiological Chemistry. His subject was "The effects of the Synthetic Estrogens Upon the Thyroid Gland."

* * *

Dr. F. Norman Pansch announces the opening of offices for the practice of obstetrics and gynecology in Appleton, Wisconsin. Dr. Pansch interned at Ancker Hospital in Saint Paul in 1936-37, and held a fellowship in obstetrics and gynecology at the Mayo Foundation, 1937-40.

* * *

The University of Minnesota board of regents has accepted a gift of $1,240 from the National Foundation for Infantile Paralysis to be used for a six-months course in orthopedic nursing, beginning with the winter quarter.

Among medical officers of the United States Naval Reserve who are under orders for active duty are:

Lieutenant Frederic F. Wipperman of Minneapolis, to Naval Reserve Air Base, Minneapolis.

Lieutenant Herbert H. Schneider of Rochester, to Naval Hospital, Pensacola, Florida.

* * *

Dr. F. H. Krusen of Rochester represented the Council on Physical Therapy of the American Medical Association at a meeting of the Federal Communication Commission in Washington, D. C., November 29. The meeting was concerned with radio interference by electromedical apparatus.

* * *

Dr. R. H. Beiswanger, physician in Wykoff for eleven years, has disposed of his practice to Dr. Richard Herbst, a recent graduate of the medical school of the University of Minnesota. Dr. Beiswanger with his family has moved to St. Louis Park, and will take a three-year fellowship at the University of Minnesota in roentgenology.

* * *

Dr. Harold S. Diehl, as a member of the Council on Medical Education and Hospitals of the American Medical Association, participated in a survey of the Louisiana State University Medical School in New Orleans recently. Others who took part were Dr. William Cutter of Chicago, secretary of the council, and Dr. Herman Weiskotten, dean of the Syracuse University Medical School.

* * *

Dr. J. A. Williams, who recently completed an internship at St. Mary's Hospital in Duluth, is assistant to Dr. E. K. Rowles at the Rood Hospital in Coleraine. Dr. Williams replaces Dr. A. C. Kelly, who recently took over the practice of Dr. Roy Mayne of Duluth. Dr. Mayne, a medical reserve officer, was called to active duty in the United States Navy.

* * *

Dr. Henry E. Michelson, director of the division of dermatology at the University of Minnesota Medical School, has been invited to give the addresses in dermatology and syphilology at the three-day Post-Graduate Clinics of St. Louis, Missouri, March 11, 12 and 13. The clinics are being sponsored by the St. Louis Medical Society.

* * *

Dr. J. P. Person of Giltner, Nebraska, has become associated in practice with Dr. S. A. Whitson and Dr. Donald Stark Branham in Alden.

Dr. Person began his practice in Alden, November 29, and four days later was elected president of the Civic League at Alden. He succeeds Dr. Whitson, who asked to be retired from the presidency which he has held for a number of years.

* * *

Dr. D. C. Lochead, deputy city health officer at Rochester for sixteen years, has resigned, effective April 14, 1941, and Dr. Floyd M. Feldman, director of rural health of District 3 of the Minnesota State Board of Health with headquarters in Rochester, has been appointed part-time deputy, effective January 1. Dr. Feldman, a graduate of the University of Minne-

sota Medical School, was formerly associated with the hospital for Indians at Red Lake.

* * *

Sponsored by the Hennepin County Medical Society and the Minneapolis Surgical Society, the second annual fracture symposium will be presented at the Minneapolis General Hospital and the Society Auditorium, January 6.

Dr. Fraser Baillie Gurd, surgeon with the Canadian Expeditionary Force in the first World War and attending surgeon at the Montreal General Hospital, will be the principal speaker. His subject will be "Treatment of Gunshot Wounds."

* * *

Dr. Karl H. Pfuetze, who has been assistant to Dr. W. D. Beadie at the Mineral Springs Sanatorium for the past few months, has been appointed superintendent of the Sanatorium to succeed Dr. Beadie who recently resigned because of ill health.

Dr. Pfuetze's appointment was effective December 4. Before coming to Mineral Springs, Dr. Pfuetze was assistant at the Nopeming Sanatorium.

Dr. and Mrs. Beadie have gone to Windom to make their home.

* * *

Attending the meeting of the American Academy of Dermatology and Syphilology in Chicago, December 8-11, were Drs. P. A. O'Leary, L. A. Brunsting and Hamilton Montgomery of Rochester, and Drs. H. E. Michelson and L. H. Winer of Minneapolis.

Dr. Montgomery was chairman of the dermatopathology roundtable. Dr. Michelson, as a member of the American Board of Dermatology and Syphilology, spent the week prior to the session assisting in examination of candidates.

* * *

The Minnesota Society for the Control of Cancer filed articles of incorporation, December 12.

Dr. William A. O'Brien of Saint Paul is president of the society; Dr. Max W. Alberts of Saint Paul, vice president; Mrs. S. L. Carr of Minneapolis, secretary; Louis W. Hill, Jr., of Saint Paul, treasurer.

Other members of the board are Dr. Charles W. Mayo of Rochester; Dr. Guy Stanton Ford, president of the University of Minnesota; Mrs. Howard Overman of Saint Paul and Mrs. Harlow Hanson of Minneapolis.

* * *

Dr. Russell M. Wilder of Rochester has been named chairman of a national committee to study nutritional aspects of national defense. This new committee on food and nutrition was set up by the National Research Council.

In accepting the chairmanship, Dr. Wilder relinquished the chairmanship of the committee on medicine and the subcommittee on nutrition to which he was appointed last summer.

Dr. Wilder attended an organization meeting of the new committee in Washington, D. C., early in December.

Organization of a general hospital unit for service in any theater of operations in the event of war is being sponsored by the Mayo Clinic and the Mayo Foundation. The unit will be known as the 71st General Hospital Unit. It is one of 102 units authorized by the war department, and is the second to be organized in the state, the University of Minnesota sponsoring the other unit. In the first World War, the Mayo Clinic and the Mayo Foundation coöperated with the University of Minnesota Medical School in the organizing of Base Hospital 26.

* * *

Inoculation of 800 University of Minnesota students with a newly developed influenza vaccine was begun December 11, in an effort to test effectiveness of the serum if an epidemic now on the West Coast spreads to Minneapolis.

A limited supply of the vaccine was obtained from the Minnesota State Board of Health which is cooperating with the Rockefeller Institute for Medical Research in testing the vaccine. Similar tests are also being carried on in other cities.

Inoculations were begun in December, according to Dr. Donald Cowan who is assistant to Dr. Ruth Boynton, director of the Student Health Service, because it has not been determined how soon the vaccine becomes effective, and because it can be tested only during an epidemic.

* * *

Enlargement of the field of scientific research was urged by Dr. Guy Stanton Ford, president of the University of Minnesota, in his biennial message to the board of regents, December 13. The report was the last he will deliver, for he retires in June after twenty-eight years in leading administrative posts on the campus.

Pointing out that American industry invests $300,000,000 annually in medical research alone, Dr. Ford urged support of research in the university.

"With all appreciation of the friendly understanding of the last legislature," he said, "I have never been able to follow why the modest and inadequate sum granted for research in our medical school was reduced.

"The $5,00 thus saved, if 'saved' is the word to use, would have enabled a specially competent group to make a beginning on a perhaps long-time campaign against such heart-rending disease as epilepsy, or on other diseases from which we now only pray that chance will deliver us and our children.

"When similar diseases invade our fields or our herds, we bestir ourselves mightily."

* * *

A portrait of Dr. Jennings C. Litzenberg of Minneapolis, University of Minnesota professor emeritus and for many years head of the obstetrics and gynecology department at the University Medical School, was unveiled at a dinner at the Minneapolis Club, December 19, and was presented to Dr. Guy Stanton Ford, president, who received the gift for the University. The portrait was painted by Edward Brewer of Saint Paul.

Guests included a group of men who received their

Ph.D. degrees at the University under Dr. Litzenberg: Drs. Roy E. Swanson, S. B. Solhaug, L. A. Lang, M. Abramson, E. C. Maeder of Minneapolis and Drs. L. W. Barry and E. M. Kasper of Saint Paul.

Department heads of the Medical School who were among the guests were: Dr. Harold S. Diehl, dean of medical sciences; Dr. J. L. McKelvey, head of obstetrics and gynecology; Dr. Frank Burch, ophthalmology and otolaryngology; Dr. Irvine McQuarrie, pediatrics; Dr. Owen Wangensteen, surgery.

Fred B. Snyder represented the board of regents. Other guests include Dr. Robert Mussey of Rochester, and Dr. Russell Morse, president of the Hennepin County Medical Association.

* * *

In addition to those listed in the December issue of MINNESOTA MEDICINE the following medical reserve officers in the United States Army have been called to active duty:

Dr. John H. Grindlay of Rochester, first lieutenant, to Randolph Field, Texas.
Dr. F. P. Army of Preston.
Dr. J. A. Mason of International Falls, first lieutenant, assigned to Camp Joseph T. Robinson at Little Rock, Arkansas.
Dr. John Johnson of Kerkhoven.
Dr. D. M. Potek of International Falls, first lieutenant.
Dr. C. G. Wingquist of Crosby, captain.
Dr. Luverne J. Webster of Battle Lake, head of Otter Tail County Sanatorium, assigned to Camp Joseph T. Robinson at Little Rock, Arkansas.
Dr. Leo Francis Bach of Mapleton, captain.
Dr. Edward Bruce Badger of Minneapolis, captain.
Dr. Robert Jacob Brotchner of Saint Paul, first lieutenant.
Dr. Albert Sinai Brussell of Saint Paul, captain.
Dr. Henry B. Clark, Jr., of Saint Paul, captain, assigned to Camp Joseph T. Robinson.
Dr. Maurice F. Ekstrom of Saint Paul, first lieutenant, assigned to Camp Joseph T. Robinson.
Dr. Harry Samuel Friedman of Minneapolis, first lieutenant.
Dr. William C. Hartland of Crosby, captain.
Dr. Jack Hartman of Minneapolis, first lieutenant.
Dr. Paul Kisner of Fort Snelling, captain.
Dr. Carl John Lind, Jr., of Minneapolis, captain.
Dr. Joseph Francis Melancon of Saint Paul, first lieutenant.
Dr. Joseph C. Olson, Jr., of Saint Paul, first lieutenant, assigned to Camp Joseph T. Robinson.
Dr. Sidney S. Scherling of Taylor Falls, captain, assigned to Camp Joseph T. Robinson.
Dr. James M. Brown of Caledonia, first lieutenant, assigned to Camp Joseph T. Robinson.
Dr. Wayne S. Hagen of Minneapolis, captain, assigned to Camp Grant, Illinois.

* * *

A large number of Minnesota men were in attendance at the fiftieth anniversary meeting of the Western Surgical Association, which was held December 6 and 7 in Topeka, Kansas, the city in which the association was founded.

The Association voted to hold its 1941 meeting in Saint Paul next December.

Among those who participated in the program at the Topeka session were Dr. S. W. Harrington and Dr. H. Waltman Walters of Rochester. The latter's subject was "Malignant Lesions of the Stomach; Results of Treatment from 1907 through 1938."

Dr. Harry B. Zimmerman of Saint Paul was elected recorder.

Among those elected to membership in the Association were Dr. Wallace P. Ritchie of Saint Paul, and Dr. J. T. Priestley of Rochester.

Attending the meeting besides Drs. Harrington, Walters and Zimmerman, were: Drs. Harry P. Ritchie, Robert Earl, E. Mendelssohn Jones, and N. Logan Leven of Saint Paul; Drs. A. E. Benjamin, William T. Peyton, Arthur C. Strachauer, O. J. Campbell, Martin Nordland, Roscoe C. Webb, S. R. Maxeiner and T. J. Kinsella of Minneapolis; Drs. William Dean Coventry and A. L. McDonald of Duluth; and Drs. A. W. Adson, C. F. Dixon, V. S. Counseller, and W. McK. Craig of Rochester.

LIST OF PHYSICIANS LICENSED

(Continued from Page 47)

Pender, John William—Tulane U., M.D. 1935, Rochester.
Petit, Julian Victor—U. of Minn., M.B. 1940, Minneapolis.
Petkevich, Frank Michael—U. of Chicago, M.D. 1937, Minneapolis.
Pleissner, Karl William—U. of Minn., M.B. 1940, Minneapolis.
Ponterio, James Edmund—Creighton U., M.D. 1940, Saint Paul.
Potter, Robert Tippett—U. of Minn., M.B. 1939, Minneapolis.
Pratt, Joseph Hyde, Jr.—Harvard U., M.D. 1937, Rochester.
Pruitt, Raymond Donald—U. of Kansas, M.D. 1939, Rochester.
Rogers, George Edward Brien—U. of Toronto, M.D. 1938, Minneapolis.
Rushmer, Robert Frazer—Rush Med. Col., M.D. 1939, Rochester.
Schulze, William Matthew—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.
Schwyzer, Arnold Gustav—Johns Hopkins U., M.D. 1939, Saint Paul.
Sluder, Fletcher Sumpter, Jr.—Rush Med. Col., M.D. 1938, Rochester.
Smith, Frank Baker—McGill Univ., M.D. 1937, Rochester.
Strough, LaVern Craig—U. of Neb., M.D. 1939, Minneapolis.
Sutton, Janet Beth—U. of Minn., M.B. 1939, Minneapolis.
Wise, Ralph Waldo Emerson—U. of Iowa, M.D. 1939, Rochester.

By Reciprocity

Blum, Otto Schidler—U. of Wis., M.D. 1929, La Crosse, Wis.
Chesley, Ward Bennett—U. of Mich., M.D. 1937, Virginia.
Galloway, John D. Brown—Temple U., M.D. 1934, Minneapolis.
Hausmann, Paul Frederic—Northwestern, M.B. 1938; M.D. 1939, Rochester.
Mulmed, Earl I.—U. of Okla., M.D. 1937, Rochester.
Nielsen, Ariel Elias—U. of Louisville, M.D. 1936, Douglas, Wyo.
Noble, Philip Cornelius—Rush Med. Co., M.D. 1929, Minneapolis.
Patch, Orien Bailey—Western Reserve, M.D. 1935, Duluth.
Person, John Paul—U. of Neb., M.D. 1934, Alden.
Rosenbaum, Edward E.—U. of Neb., M.D. 1938, Rochester.
Rosenberg, Charles Freelan—U. of Wis., M.D. 1936, Madison, Wis.
Zeman, Edward William—U. of Neb., M.D. 1936, Omaha, Neb.

National Board Credentials

Boyd, Edith—Johns Hopkins, M.D. 1921, Minneapolis.
Flannary, Hubert Farber—Rush Med. Col., M.D. 1939, Saint Cloud.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR JANUARY

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

The program for the month will be as follows:

January 4—Common Cold.
January 11—Influenza.
January 18—Pneumonia.
January 25—Exodontia.

ANNUAL FORUM ON ALLERGY

The third annual Forum on Allergy will take place Saturday and Sunday, January 11 and 12, 1941, at Indianapolis, Indiana. The intensive program condensed to fill one week-end is the result of suggestions on the part of those who attended the last meeting in Chicago in January, 1940. Of the physicians who attended last year's meeting 146 have signed up for this year's week-end. Both clinicians and those in attendance come from every part of the country. The topics to be discussed will be of interest to internists, pediatricians, dermatologists, otolaryngologists, and all engaged in the practice of medicine.

Registrations should be mailed in advance to Dr. Toll Nelson, 636 Church Street, Evanston, Illinois.

E. STARR JUDD LECTURE

The eighth annual E. Starr Judd lecture at the University of Minnesota will be delivered by Dr. Andrew C. Ivy, professor of physiology and pharmacology at Northwestern University Medical School, January 15. His subject will be "The Mechanism of Gastric Secretion."

MINNESOTA PATHOLOGICAL SOCIETY

Dr. W. M. Stanley of the Rockefeller Institute for Medical Research, Department of Animal and Plant Pathology, Princeton, New Jersey, will address members of the Minnesota Pathological Society, January 21. He will speak on "Some Chemical, Medical and Philosophical Aspects of Viruses."

PHYSICAL THERAPY COURSE FOR TECHNICIANS

The Medical School of the University of Minnesota will inaugurate a course for the training of technicians in Physical Therapy beginning with the Summer Session of 1941. This is a twelve-month course open to graduate nurses, graduates in physical education and graduate medical technicians. The curriculum will cover the entire field of Physical Therapy with abundant clinical training in affiliated hospitals.

Since there is a shortage of well-trained physical therapy technicians in the United States, this course offers excellent training in a field which is rapidly developing and is still full of opportunities. It is believed that in the event of war the army hospitals will require more technicians than are registered in the entire country at the present time.

MINNESOTA STATE SANITARY CONFERENCE

Dr. D. C. Lochead of Rochester was elected president of the Minnesota State Sanitary Conference at a meeting in Minneapolis, November 29. Dr. A. J. Chesley of Saint Paul was reëlected secretary-treasurer, and Dr. C. N. Harris of Hibbing was named vice president. New directors elected to serve until 1943 are Dr. A. T. Laird, of Nopeming, Dr. G. H. Luedtke of Fairmont and Dr. J. P. Wilkins of Mound.

Dr. J. Lawrence McLeod of Grand Rapids is a new member of the Legislative Committee.

Physicians on the conference program included: Dr. T. B. Magath, Rochester health officer and vice president of the state board of health; Dr. O. O. Larsen of Detroit Lakes, who served as president of the conference during the past year; Drs. L. W. Foker and L. S. Arling, State Medical Association Committee; Dr. F. M. Feldman of Rural Health District 3; Dr. J. F. Worley, U.S.P.H.S., director of the Indian Medical Service; Dr. R. R. Sullivan and Dr. Hilbert Mark of the Minnesota State Department of Health; Dr. H. S. Diehl of the University of Minnesota; Dr. L. L. Sogge, chairman of the Public Policy Committee of the State Medical Association; Dr. A. T. Laird, superintendent of Nopeming Sanatorium; Dr. L. J. Webster, superintendent of the Otter Tail County Sanatorium; Colonel Kent Nelson, M.C., United States Army.

RICE COUNTY MEDICAL SOCIETY

Dr. C. Dexter Lufkin of Northfield was elected president of the Rice County Medical Society at the annual meeting in Faribault recently. Other officers elected are Dr. Carl A. Traeger of Faribault, vice president, and Dr. Paul Weaver of Faribault, secretary-treasurer.

NICOLLET-LE SUEUR MEDICAL SOCIETY

Dr. J. F. Traxler of Henderson was elected president of the Nicollet-LeSueur Medical Society at the organization's annual meeting in St. Peter. He succeeds Dr. Burton Grimes of St. Peter.

Dr. A. S. Nissen of St. Peter was elected vice president, and Dr. C. S. Strathern of St. Peter, secretary-treasurer. Dr. Nissen was named delegate to the state medical convention, and Dr. Swan Ericson of Le Sueur, alternate.

Guest speaker at the meeting was Dr. Owen Robbins of Minneapolis.

GEORGE CHASE CHRISTIAN LECTURE

Dr. F. Peyton Rous of the Rockefeller Institute for Medical Research, New York City, will deliver the annual George Chase Christian lecture at the University of Minnesota early in February.

The title of his lecture, which will be concerned with a phase of cancer research, has not yet been announced.

SIOUX VALLEY MEDICAL ASSOCIATION

Dr. E. A. Kilbride of Worthington, Minnesota, is the newly elected president of the Sioux Valley Medical Association, composed of physicians from South Dakota, Iowa, Minnesota and Nebraska.

He was elected at the closing session of a two-day convention held in Sioux Falls, South Dakota, December 4 and 5. Sioux City was chosen as the 1941 meeting place.

Other officers named were Dr. R. S. Westaby of Madison, South Dakota, vice president; Dr. Roy E. Crowder of Sioux City, secretary; and Dr. F. P. Winkler of Sibley, Iowa, treasurer.

AMERICAN COLLEGE OF SURGEONS SECTIONAL MEETING

A sectional meeting of the American College of Surgeons will be held in Minneapolis, March 10, 11 and 12.

More than a thousand surgeons from eight states and one Canadian province are expected to attend. Participating will be surgeons from Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Wisconsin, Kansas, Montana and Manitoba.

In addition to Fellows of the College, members of the medical profession at large, and persons interested in the institutional care of the sick and injured, are invited to attend. The general public is invited to a meeting on Health Conservation to be held the evening of March 12, in Northrop Memorial Auditorium on the University campus.

The program will include the presentation of all types of surgery in hospitals and clinics, papers and panel discussion. More than a score of national figures in surgery will appear as guest speakers. In addition, an elaborate scientific exhibit will feature the meeting.

Dr. William A. Hanson has been named chairman of the Minneapolis committees on arrangements. Dr. William E. Patterson and Dr. Myron O. Henry will serve as vice chairmen, and Dr. James M. Hayes, as secretary.

Chairmen of sub-committees are Dr. L. Haynes Fowler, clinics; Dr. Frederick A. Olson, exhibits; Dr. Thomas J. Kinsella, meeting on health conservation; Dr. James A. Johnson, program; Dr. Martin Nordland, public relations and speakers' assignments; Dr. Theodore H. Sweetser, reception and entertainment; Dr. Arthur F. Bratrud, motion pictures; and Dr. Henry E. Hoffert, transportation and hotels.

Mrs. James A. Johnson is chairman of the committee on ladies' entertainment. She is being assisted by Mrs. Russell W. Morse, vice chairman.

SIGMA XI LECTURES

The University of Minnesota chapter of Sigma Xi, national honor society in science, is again sponsoring a series of science lectures for the general public.

The lectures will be presented in Northrop Memorial Auditorium at 8:15 p. m. on four Fridays in January and February. There is no admission charge.

Opening the series will be Dr. Lloyd H. Reyerson, who will lecture on "Chemistry and Our National Defense," January 31. Dr. Reyerson is professor and administrative assistant in chemistry.

On February 7, Dr. Maurice B. Visscher, head of the division of general physiology in the Medical School, will speak on "Your Heart and You."

"The Common Cold" will be the title of the lecture to be given by Dr. Harold S. Diehl, dean of medical sciences, February 14.

The concluding lecture of the series will be given February 21 by Dr. William A. O'Brien, director of post-graduate medical education. His subject will be "Meeting Middle Age."

CORRESPONDENCE

MANTOUX TESTS IN ALBERT LEA HIGH SCHOOLS

During 1939, the Freeborn County Medical Society performed the Mantoux test on 985 students in the Junior and Senior High School of the Albert Lea schools. Of this entire group 72 (7.2+ %) were found positive. Within this group were thirty-four pupils from the rural area, who had driven with a school bus driver having an active case of pulmonary tuberculosis. Of these, fifteen (44+ per cent) were found to react positively. This bus driver, formerly a farmer, found that farm work brought on fatigue, so he sought and obtained his rest cure as a school bus driver. There was no one to say him nay. He continued driving and coughing (and here we quote from patrons of the school) "until he became so weak he could not turn the bus around alone. Then he quit."

It seems that such tragedies could be largely prevented, if regulations were made and enforced in all schools, that before any contracts are given, all prospective employees of a school must present a certificate that they are free from active tuberculosis, as revealed by the best known methods at our command—the Mantoux test, x-ray and physical examination.

L. J. KAASA, M.D.

NOTICE

To whom it may concern:

The undersigned, Daniel H. Bessesen, M.D., formerly vice president of the College of Commerce, Inc., has resigned and relinquished his association with said corporation, as of the date, November 16, 1940, and any further use of my name since that date, in connection with the business or affairs of the College of Commerce, Inc., is unauthorized.

(Signed) DANIEL H. BESSESEN.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of October 9, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 9, 1940. Dinner was served at seven o'clock and the meeting was called to order at 8 p.m. by the President, Dr. James Johnson.

There were fifty-six members and three guests present.

Minutes of the May meeting were read and approved.

Dr. S. E. Sweitzer read the following Memorial to Dr. Frank R. Wright, and a motion was carried that this be spread on the minutes of the Academy and a copy sent to the family.

FRANKLIN R. WRIGHT

1866-1940

Dr. Franklin Randolph Wright, prominent Minneapolis urologist, died August 1, 1940, at the age of 74 years.

Dr. Wright had been a member of the university faculty for 41 years at the time of his retirement in June, 1936, with the rank of Associate Professor Emeritus of Urology. The American Urological Association and the Twin City Urological Society, of which he had long been an influential member, honored him in May of this year through the establishment of the Franklin R. Wright lectureship at the university.

A pioneer in the urological field, Dr. Wright gave their training in venereal disease control to most of the doctors graduated at Minnesota since the turn of the century.

He was born in Canton, Illinois, the son of a physician, Colonel George W. Wright. Following his graduation from the Shenandoah, Iowa, high school, he entered the dental school of the Minnesota Hospital College in 1887, and was graduated in 1890 after the institution had become the dental department of the university.

After two years of dental practice in Hutchinson, Minnesota, Dr. Wright returned to the university to study medicine and received his M.D. degree in 1894. After his internship in Asbury and St. Barnabas hospitals, Dr .Wright did dermatology and venereal disease work with Dr. Max Vander Horck. He was appointed to the university faculty in 1895. Three times—in 1900, 1902 and 1906—Dr. Wright went abroad to take postgraduate work in Berlin and Vienna. During the World War he had charge of the urological work at Camp Custer.

Dr. Wright was made a Fellow of the American College of Surgeons in the 1913 class—the first class chosen by the group's founders. He also was a member of the American Urological Association, the Twin City Urological Society, the Minnesota Dermatological Society, the Chicago Urological Society, the American Medical Association, the Minnesota Academy of Medicine, the Minnesota State Medical Association and the Hennepin County Medical Society.

He also was a member of the Minneapolis Club, the Masonic order and Nu Sigma Nu medical fraternity, and was on the staffs of University, St. Andrews, St. Barnabas, and Eitel hospitals. He retired from active practice recently.

With the death of Dr. Franklin R. Wright, Minnesota has lost one of its outstanding medical men. He loved to teach and did teach for many years at the University of Minnesota. Any young medical man could ask advice from him and it would be freely given. He had a marvelous memory and enjoyed discussing papers, which he did in an inimitable way. His remarks were pungent and he always said what he really thought and was usually right.

The writer went with him to the meetings of the Minnesota Academy of Medicine in Saint Paul for many years. Driving him over from Minneapolis, we talked of many things from "cabbages to kings." He was an interesting personality and a loyal friend.

He will be missed and has left an honorable record of achievements in medicine in Minnesota. —S. E. S.

The scientific program followed.

IDIOPATHIC ULCERATIVE COLITIS

ARNOLD SCHWYZER, M.D.
Saint Paul, Minnesota

To bring this subject for discussion notwithstanding the very small personal experience to which I must confess from the start, has a twofold cause. First of all, the views as to the proper treatment, medical as well as surgical, still differ considerably; and second, my personally observed cases may have some points of interest.

It is not the intention to go into a general discussion of the disease and its treatment beyond a few remarks. One is impressed by the divergent views regarding the treatment when one studies Bargen's work based on the enormous material of the Mayo Clinic and then goes through a paper on the subject read by McKittrick before the American Surgical Association in 1935. The discussion following that paper is of particular interest to the surgeon. Just what is best to do when surgical relief becomes imperative cannot be stated categorically. We are here confronted by a problem where surgery to bring relief in one direction creates often an almost intolerable condition in other ways.

Bargen of the Mayo Clinic appears to have had more experience with medical treatment than perhaps anybody else. In 1933 he reports on a ten years' experience with 1,348 cases[1] He isolated a diplostreptococcus which he considers specific not for all, but for the great majority of these cases. He studied the lesions microscopically and found thrombotic conditions not only in the mucosa but also in the deeper

walls of the gut. Thus one of the characteristics of the disease becomes readily comprehensible, namely the great thickening of the gut wall and the cicatricial foreshortening of the colon tube with loss of haustration. In order to designate this overwhelmingly large group due to a specific agent among the generally named idiopathic form he calls it "thrombo-ulcerative" or also "diplostreptococcic ulcerative" colitis. The bacteriologic findings were apparently not in harmony with the studies at the Massachusetts General Hospital; but when Bargen reports out of 1,348 patients 898 as symptom-free, plus 82 as greatly improved, one cannot help being impressed. About 10 per cent are reported as having died and about 8 per cent as unimproved. These patients were treated with a specific anti-diplostreptococcic serum followed by vaccine injections every five days for months. If possible this vaccine was to be autogenous.

McKittrick does not discuss other treatment than the surgical after medical had proven to be helpless or inadequate[4] As the few cases I am to report were judged to require prompt surgical relief except one, I am not going to discuss the medical treatment and will now simply report on our surgical management.

Case Reports

Case 1.—Mrs. F. P., thirty-three years old, came to us in February, 1919, with a history of having suffered from pain and diarrhea for five years. The bowels moved five to six times a day, and she had much abdominal pain. There were no amebæ found. By different measures she was more or less improved, but returned very discouraged and miserable in February, 1920, after having had frequent spells of great pain. An appendicostomy was made on February 25, 1920, followed by irrigations of the colon, first twice a week and later once. Her best weight ever had been 130 pounds. At the time of operation it was 107 pounds. Four months later it had gone up to 115. She looked very well and felt better. The catheter in the appendicostomy was then removed. After a while the old symptoms recurred alternating with times of some improvement. We did not see her again until February, 1926. There had been no change. The colon from the splenic flexure down showed no haustra, but was not markedly narrowed. Proctoscopically the mucosa was generally congested. She did not appear to be bad enough for surgical interference nor would she have any. We have not seen her since then. On inquiry in February, 1940, she wrote that her condition of late was very bad though she had been doctoring for all these years. A course of Bargen's treatment or with neoprontosil or possibly a colostomy would be advisable.

This is a case which might well have been greatly benefited by Bargen's serum and vaccine, had we had it in those early days. Lockhart-Mummery had considered appendicostomy "the best treatment" for ulcerative colitis.

Case 2.—Miss I. C., eighteen years old, came to us in 1922 with an intractable hemorrhagic colitis from which she had suffered for several weeks. On March 4, 1922, an appendicostomy was made, which was used for irrigations of the colon. These irrigations were done first twice weekly and later only once. She improved gradually though not steadily as there were intervals of bloody diarrhea during the first months. By January, 1923, the appendicostomy was allowed to close. She felt well and was married that same month. In 1926 she had a baby and for one month after that she noticed some blood in the stools; however, there was no pain. She was then not seen till October, 1929, when a painful hernia had developed at the site of the appendicostomy. The bowels apparently did not bother her much. When constipated she noticed a little blood, but gave it no further attention. The hernia was repaired and the stump of the appendix resected. Six weeks after this operation the last entry on her chart reads: "Pain around the navel (which had brought her back to Saint Paul with the mentioned hernia condition) is gone since the operation. Bowels need a little mineral oil every evening."

On February 22, 1940, we received upon inquiry the report that she had been "perfectly" well for sixteen years after that operation until two years ago. Her bowels had moved usually once a day and were entirely normal. She used to take some petrolagar. However, two years ago blood and pus appeared again. Her doctor declared it again ulcerative colitis after proctoscopic examination. For a whole year she was in bed and suffered very much. For three months she received daily acriflavin injections, then enemas with oil, etc., etc. At the end of that year she was taken to Rochester where Dr. Bargen treated her with serum and vaccine and neoprontosil. Within three weeks she felt well enough to go home and though she was advised to return later on, never went back as she felt completely well ever since. She thinks that cod liver oil which Dr. Bargen had ordered did her very much good. Her present weight is 160 pounds though she is only five feet and two inches tall. The bowels move from two to five times a day. Some mucus is present, but she feels and looks well. It is interesting that she was apparently very sensitive toward the serum of which she received about ten very small injections. The case is of particular interest inasmuch as some prominent men have expressed very little faith in such treatment. Another feature of interest is the demonstration that ulcerative colitis may recur after years of clinical "cure." I have little doubt that Bargen's treatment would have cured this patient at the first attack when I had charge of the patient, if the serum had been available at that time.

Case 3.—A girl, R. D., fourteen years old, was brought to us on March 7, 1930, with a history of a colitis from which the child had suffered for ten years. Her mother told us that the child had been strong for the first two years. She then seemed to do reasonably well up to the age of seven or eight years except for continuously loose stools. For the last four years, *i.e.*, from the age of ten to fourteen years, she had not grown any. She had been at the Mayo Clinic several times where at no time was any parasitic infection found. She had lived in Montana all her life. Her mother told us that a year ago multiple ulcers had been noticed in the colon. She had almost continuously blood in her stools for the last four years, and much mucus. The bowels were moving six to eight times daily. The last few years the feces had a very offensive odor. The hemoglobin had been down to 34 per cent in October, 1929, and she then had two transfusions.

Physical findings: Temperature 99.8, pulse 114. The examination of the different organs yielded nothing of interest except a painful, tender, and somewhat distended abdomen. According to the general appearance the apparent age instead of fourteen years was more readily judged to be eight years. The drawn colorless face resembled that of an old woman. She seemed to be in constant misery. The stools contained some blood and considerable pus.

On March 10, 1930, an x-ray study at St. Joseph's Hospital after an opaque enema showed most of the colon well filled. Barium had entered the lower ileum. Haustral markings were absent throughout.

On March 14, we made an ileostomy through a grid-iron incision at McBurney's point. The first intestine presenting was the sigmoid flexure which was very fleshy and rigid; its fatty fringes were hard and rounded. The cecum was found fixed toward the posterior abdominal wall and could not be brought into the wound, because when the intestines were grasped subserous bleeding occurred readily. The lowest ileum loop was also fleshy, thickened and somewhat rigid for about seven centimeters from the cecum. A little beyond this area we made the stoma. Only a cherry-size portion of the gut was allowed to protrude from the circular intestino-cutaneous suture.

Fig. 1. Case 3. Radiograph taken October, 1938. Barium enema shows loss of haustra, but rather good filling eight years after closing of ileostomy.

Fig. 2. Case 3. After partial expulsion of barium enema, polyps are seen in descending colon.

The relief after opening the ileostomy was very gratifying. The patient left the hospital on April 9, after having gained five pounds since the operation. She was still very anemic.

At the time of the operation the girl had weighed fifty-one pounds. Three months later her mother writes that the weight was seventy-one pounds and that the patient was gaining every day.

Six months after the ileostomy (September, 1930) she returned to us looking very well, but some eversion of the gut had occurred. Mother and daughter urged us intensively to close the ileostomy because she felt so well and was greatly annoyed by this additional opening. Mother and daughter were quite willing to accept all responsibility for the procedure. It seemed impossible to put them off, and on September 29 we closed the ileostomy which after all was a minor procedure, and if necessary could be undone readily. The gut was only partly freed, and the peritoneal cavity was not opened. The mucosa was simply separated from the skin and then the intestinal wall inverted with two superposed linen purse-string sutures. Two fine linen mattress sutures approximated the fascia. We expressed the possibility and even probability of having to re-open the ileostomy. A year later, September 28, 1931, the notes read that she had grown 2.5 to 3 inches since the closing of the ileostomy, in all about 4 inches since the ileostomy a year and a half before. She had felt "fine" up to July, but with the advent of hot weather, she was "not quite as well." The bowels became "terribly" loose again. A small fecal fistula had persisted; there was, however, only very little fecal discharge. The bowels had then become somewhat better, moving about four times in twenty-four hours. This improvement seemed to be due to paracotoin given by mouth. The fistulous tract became gradually almost insignificant so that it did not seem advisable to do much of an operation. However, minor attempts like hot wire cauterization and resuturing having been unsuccessful, a free opening of the peritoneal cavity would be necessary for a complete closure. So far we have held back. The patient has developed into a stately young woman, has grown much in height, and when last seen in October, 1938, was of good normal weight.

Roentgenologic examination was last made in October, 1938. There was evidence of polyposis and the walls of the colon were seen to be very thick. The patient is therefore far from being cured though her general appearance was excellent when we last saw her. It must be taken into consideration that she had been a very severe case and that other measures had been fruitless. For four years she had been treated at intervals at the Mayo Clinic. She had gone through two series of serum treatment followed each time by vaccine injections every five days for six months.

The Rochester Clinic very kindly let us see the roentgenograms made in 1925, 1927, and 1929. Already in July, 1925, the pictures show the lack of haustra and a reflux into the ileum. The colon is quite narrow and shortened. In the 1929 pictures the outline of the barium shadow is fuzzy. A roentgen film made on October 28, 1938, nine years and eight months after the ileostomy shows nothing to be proud of, but the barium shadow gives measurements which appear at least not to have become worse in the eight years since the ileostomy was closed. These measurements are about the same as in 1927 and rather better than in 1929. As mentioned, the shadow of the walls of the colon is seen to be quite thick in the 1938 pictures. They measure mostly about 3/16 of an inch, part of which may, however, be accounted for by the contraction of the emptied gut. After partial emptying of the enema some small polyps are well recognizable in the descending colon (Fig. 2).

Upon our inquiry the young lady writes on February 12, 1940: "My general health is very good. I weigh 113½ pounds, and I am 5 feet ½ inch tall. My hemoglobin is 80 per cent (Sahli). I believe this is better than it has ever been. I do have cramps quite frequently. My bowels move on an average of about seven times in twenty-four hours. I also have a little pain at times. My side drains very little now. I change the dressing about once every two days. It sometimes gets a little irritated, but otherwise does not bother me a lot. My appetite is good and my strength and vitality are very good." It seemed proper to give this report in full as I have not run across case reports where an ileostomy was closed secondarily and was followed by a liveable condition ten years after the ileostomy. The contrast between this favorable report

and the x-ray pictures which demonstrate a far-advanced condition is surprising and noteworthy.*

Case 4.—Mrs. H. C., thirty-five years old, was first admitted to St. Joseph's Hospital under Dr. J. N. Dunn's care on April 1, 1931, for a severe diarrhea which had started acutely a month previously and

Fig. 3. Case 4. Radiograph taken April 8, 1932, six months after ileostomy. The general condition was very much improved.

Fig. 4. Case 4. Radiograph taken October 25, 1933. Notwithstanding the splendid general improvement, the shrinking has progressed when compared with Figure 3, taken a year and a half previously. Note the great thickening of the walls of the colon.

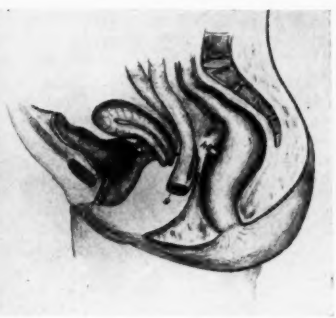

Fig. 5. Case 4. Sketch of ileoproctostomy. Ileum drawn into vagina and one-half of Murphy button (*B*) inserted. The other half is in the infraperitoneal part of the rectum.

was getting worse. She had had lighter spells like this several times since 1927. This time the patient had noticed a great deal of mucus and blood from the start of the attack. Of late there were ten to twelve stools every twenty-four hours. Bacteriologic examination of the stools were negative for dysentery, typhoid or paratyphoid bacilli; nor were amebæ found at any time. Much pus and some red cells were seen. The white cell count was 17,200 on April 1, 1931, and 20,100 on April 10. The hemoglobin was 77 per cent. Examination revealed nothing further of interest except a moderate tenderness of the abdomen. Proctoscopic examination (Dr. Dunn) showed the rectal mucosa far up intensely reddened, covered with a purulent discharge and blood. She was treated with different medicaments and irrigations. On April 25 she was allowed to go home, being improved. In October, 1931, she reëntered the hospital and was kindly given into our service. X-ray examination showed the large gut from the left side portion of the transverse colon downward to be narrowed to a ribbon-like tube. The cecum, ascending colon, and proximal part of the transverse colon appeared normal.

Since March she had lost 40 pounds and had had diarrhea alternating with constipation, at which latter periods she suffered from severe bearing-down pains. A stricture of the rectum had been stretched several times.

On October 19, 1931, an ileostomy was then done through a muscle splitting incision at McBurney's point. On November 1 our patient was discharged. She returned for control November 28 feeling "grand" as she expressed it. On October 27, her weight had been 78 pounds. She gradually gained very much in weight and looked not only well but was actually quite plump, apparently heavier than she ever had been. She had gone through so much torture before the ileostomy that she put up with the ileostomy for a long time, but after two years and four months she wanted the artificial anus closed.

*After writing this paper I received word that the patient died suddenly of what seems to have been an embolus. Her mother writes she had been feeling exceptionally well this past summer.

This case represented a very vicious and rapidly progressing destructive process. On October 14, 1931, the transverse colon had filled to a diameter of over 1.5 inches and showed deep haustra. By October, 1933, the proximal half of the transverse colon had also shrunk down to a 3/8-inch diameter while the whole left side colon showed as a narrow ribbon (Fig. 4). What was there to do? The right sided colon was of good dimension, but from the hepatic flexure on there was only a thin ribbon left down to the last portion of the ampulla which was about the size of a large plum. I am sure if I had freed the hepatic flexure from its lateral peritoneal attachment and had brought it out obliquely through the right rectus muscle which latter would have acted as a sphincter, her stoma would have been very much less bothersome. H. L. Beie of Iowa City has used this "compromise colostomy" with good success, and it would probably have been the best thing to do under the circumstances. However, our young patient was willing to take all chances to have done away with the artificial opening. A woman wants to be clean and attractive. We deliberated much about a way out of this dilemma. When one entered the upper loop of the ileostomy with a thick sound the tip of it could readily be felt behind the uterus per vaginam. This made us try an anastomosis between this gut and the remnant of the ampulla.

On February 27, 1934, an ileo-proctostomy was made. Under spinal anesthesia vagina and rectum were well cleansed. The remnant of the ampulla did not reach higher than about the upper rim of the internal sphincter. A merthiolate-soaked sponge was inserted into this pocket. Then the posterior cul-de-sac was opened and the ileum loop in which the large bougie was felt was brought into the vagina and a linen purse-string placed in it. The one-half of a small Murphy button was then introduced and the suture tied around it. Then with a finger in the rectum, the musculature of the internal sphincter was laid bare in the vaginal incision and the other half of the button which had a wider rim than its partner was inserted through the anus, the mucosa nicked over it, and the two halves of the button closed. This looked like a very neat union. On account of the thinness of the gut wall, we did not dare to place additional sutures. A collapsible rubber drain was placed to one side of the ileum into the Douglas space. The opening in the vaginal wall was not sutured but simply packed lightly with metaphen

moistened gauze to assure sufficient drainage and fixation of the loop. A free discission of the anus was made posteriorly to relieve all tension. The ileostomy opening was, of course, left open.

The postoperative course at first was reasonably good though the patient was quite weak. But after two weeks the button had worked loose from the rectum and fecal discharge came through the vagina. The button with the ileum gradually receded toward the sacrum upward, and a month after the operation (March 27) the button had to be removed through the vagina. A thrombosis developed in the left iliac vein and the patient died on April 6.

It was surprising that the rectal wall with the comparatively heavy muscular wall gave way though it contained the wider half of the button. It again demonstrates the importance of the peritoneal covering of the gut with its ready agglutination and fixation to other peritoneal surfaces. The rectal wall had no peritoneum to act promptly for the accomplishment of a union before the button became loose. An additional factor was probably a degree of colitic infection of the rectal wall. We had anticipated this possibility but relied on the large size of the lower half of the button and the fixation of the ileum loop by the packing. There was no peritonitis beyond the localized area of the drained parts in the bottom of the pelvis. A periproctitis as a result of the giving way of the button was undoubtedly the reason for the thrombosis of the iliac vein. In a similar case it would be advisable to fasten the button by a silk thread to a cross bar outside the anus or some similar fixation. The procedure gave the impression that it was a good way out of the necessity of a permanent artificial anus after ileostomy. Perhaps drawing the ileum into the rectum or an additional suture of the ileum loop to the edge of the transverse vaginal incision might have led to success. In case the gut is as thin-walled as in the described case it might be well to use the adjoining mesentery. A lesson to be had from this case is that the extra-peritoneal rectal wall cannot be trusted to hold much in similar cases.

Case 5.—On February 12, 1937, Mrs. A. L. came to see us. She had been married thirteen years, but had never been pregnant. She had been in a sanatorium for a nervous breakdown, and had suffered from colitis with much discharge of mucus for twelve to fifteen years. However, there had been no diarrhea until the last few days. In 1930 a caruncle of the urethra was excised and in 1933 an appendectomy and cholecystectomy had been made and a cyst of an ovary removed. Of late she had been very nervous, sleepless, and irritable. She was well built. Heart, lungs, abdomen, and urine appeared normal. By pelvic examination a rather large cyst was felt on the left ovary. There was some tremor noticed, but the basal metabolic rate was normal. There had been no marked loss of weight. The knee jerks were exaggerated. The cyst with the remainder of the ovary was then removed. It was of the size of a large orange. In addition smaller cysts of the right ovary were punctured and numerous pelvic adhesions divided.

This history is mentioned to give a picture and partial explanation of the neurotic state of the patient. She came back in January, 1938, with most emphatic complaints about her "colitis" and distress in the rectum. On examination we found a stricture of the rectum and a fissure of the anus posteriorly. A barium enema demonstrated a "marked shrinking of the lowest five inches of the rectum." Proctoscopy demonstrated a general bloody oozing from the rectal mucosa which was ulcerated. In her loud almost violent appeal for an absolutely necessary prompt help from her "insufferable" spasms she gave the impression of a desperate neurotic person ready to do most anything. An ileostomy was done on January 14, 1938, in the same manner as described in the previous case with a view to an easy closing when her wrath should turn toward this new situation. A transfusion was also given. Seven weeks later (March 3) she returned to Saint Paul for control. She was much better in every way, but complained of pain and cramps in the ileostomy area, for which injections of quinine and urea gave considerable relief. In October of the same year she returned, mainly for distress in the rectum. There were discharges of mucus and pus often with blood. Some pain was located at the midportion of the descending colon. However, a year later, March, 1939, fourteen months after the operation, she had gained from 120 to 160 pounds.

In September, 1939, she returned and asked to have the ileostomy closed. For nineteen months she had put up with the ileostomy, and she consented to take all responsibility if things should not turn out satisfactorily. It can readily be seen that this caused a favorable mental attitude toward probable future discomfort of minor degree, and we consented. The ileostomy was closed on September 26, 1939, after an injection of 300 c.c. of barley gruel into the efferent ileum loop had caused no trouble and the feces following had shown no blood. While in this case the ulcerative process was located at first mainly in the rectum, an x-ray study made by Dr. Medelman on March 22, 1939, had shown that the ulcerative lesion had extended upward since the previous examination, January 10, 1939. At that time it had involved only the rectum and lower sigmoid while now it extended to the lower part of the descending colon. Whether this extension had occurred in the early months after the ileostomy and had then been arrested remains uncertain. The steady though only very gradual improvement would make one think so.

The hospital chart records on the sixth day after the closure of the ileostomy seven defecations in twenty-four hours with intervals of from two to six hours. Nevertheless, she was allowed to go home two days later.

On February 17, 1940, she writes that she suffers much from gas and during the past months had three severe spells of pain which required morphin, but she winds up her report "on the whole, I think, I am getting along better than you ever expected I would, and I know that if I can get under conditions where I can give myself the care I should have as to work, rest, contentment, etc., I'll be all right as far as one can expect under the circumstances." She reports to have had of late from one to three bowel movements a day. Her weight is given as 165 pounds and her appetite as "unexcelled." What the future has in store for this patient is hard to predict inasmuch as recrudescences belong to the regular picture of ulcerative colitis. The fact that this patient fought energetically for the closing of the ileostomy surely is of marked psychological benefit, as it induces her to make as little as possible of bearable discomfort. On June 20, 1940, she came to our office. She looked very well and was apparently comfortable most of the time and pretty well satisfied with her condition. We advised a course of Bargen's serum and vaccine and neoprontosil[2] to be given by her home physician. Of recent days neoprontosil on account of its low toxicity, much less than some other sulfanilamide derivatives, has been used extensively by Bargen and has become a valuable drug for ulcerative colitis. Her local physician writes on September 23, 1940, that she quit using the vaccine after two months claiming she had no benefit and that sporadic outbursts of aggravation can invariably be traced to some psychic factor. She gained weight recently. Had it not been for the proctoscopic picture with the ready bleeding and ulcerated condition, one would think that the trouble was simply neurogenic. Her father had suffered from senile insanity.

Recapitulating these five cases:

All were women. The first one had a moderate chronic form where after much medical management an appendicostomy was done with a distinct temporary relief while the catheter was in place, but after removal of the catheter the condition became again more aggravated and remained about the same as before. The trouble has existed now for twenty-six years.

The second patient had an acute condition where an appendicostomy was followed by what seemed to be a complete cure for sixteen years. Then a relapse occurred of very serious character. It was promptly checked by Bargen's treatment plus neoprontosil. She has been well since then (twenty months).

The third, a very severe case, had an ileostomy with great benefit. The ileostomy opening was closed six and a half months later. She remained in good general health and was reasonably comfortable for ten years. The colon shows, however, serious changes.

The fourth patient had improved splendidly after ileostomy, but died after an unsuccessful attempt to anastomose the ileum with the remnant of the ampulla recti.

The fifth patient had an ileostomy which was closed nineteen months later (September, 1939) and up to the present (twelve months) since the closure of the ileostomy has remained satisfied.

These reported cases were clinically idiopathic ulcerative colitis. One has to exclude amebic dysentery which gives proctoscopically the picture of a rather normal not noticeably congested mucosa with here and there very small superficial ulcers. In bacillary dysentery, even in the cases later classified as chronic, the onset is most always acute, very often as part of an epidemic. The severe diarrhea is the outstanding feature. Tuberculous ulcers of the rectum occur late in a greatly emaciated patient, toward the end stage of a tuberculous process farther up, mostly in the cecum. The idiopathic ulcerative colitis, on the other hand, starts low in the large gut and progresses upward in the colon. The rectal mucosa is greatly and diffusely congested and bleeds readily. Ulcers are not easily recognized and are quite small. Bargen points out that at an early stage hyperemia and edema are seen followed soon by miliary little abscesses turning into small ulcers, which later become confluent.

Surgical Treatment

The least interfering procedure but also the least effective is an appendicostomy, followed by plain water irrigations. In general Bargen is surely right when he deprecates much flushing of the colon, as rest for the gut is important. Nevertheless, this procedure may have a beneficial influence in an occasional recent case as our second case showed. Whether the appendicostomy had much to do with the favorable outcome may be considered doubtful. Many factors come into play, not the least of which are psychic. McKittrick reports on 149 cases admitted to the Massachusetts General Hospital during the twenty preceding years. There were four appendicostomies, with two deaths. Apparently the appendicostomies were mainly performed in the earlier years of this period. Our two cases were our earliest ones. We were uncertain what to do and feared to do something that could not be undone. H. L. Beie discussed McKittrick's paper and reported on thirty-nine patients operated upon at the Iowa University Hospital. He had had very discouraging results with ileostomy (twelve cases) and therefore went back to appendicostomy and cecostomy as a compromise operation. He often saw a striking degree of improvement in the twenty-one patients operated upon in this manner. Among these twenty-one cases there were five deaths, two of which occurred in the hospital and three died subsequently from the disease. There was one cure which clinically after three years could be classed as complete. The bowel in this case is, however, not cured, as demonstrated by the roentgen findings. The bowels move only once a day. Another patient gained 20 pounds, has the catheter still in place and does heavy farm work. His bowels move twice a day. Eight other patients showed slight to considerable improvement. One patient had no benefit at all, and Beie thinks he was made worse. Of the twenty-one cases five had subsequent colectomies or colostomies. He declares to have learned that if this method is employed the tube must be worn permanently, except in a very lucky case. I have quoted Beie more or less in detail because his views appeal to me very much. Of special interest is that he performed colostomy in eleven cases as a "compromise operation" between appendicostomy and ileostomy in cases where only the left side colon was affected. In four cases he made a colostomy on the midportion of the transverse colon notwithstanding the fact that this part of the bowel was moderately diseased though less than the lower regions. When this can be done, it is of very great advantage inasmuch as the patient is immeasurably more comfortable than with an ileostomy.

Ileostomy may be the best immediate way out of serious trouble, but it leaves mostly a very unsatisfactory situation. At the Mayo Clinic it has been less and less employed for this reason. McKittrick reports fifty-four ileostomies among his 140 cases, with fifteen deaths. He very appropriately declares that in order to be satisfied with an ileostomy, a patient must have experienced what misery ulcerative colitis brings on. All three of our ileostomy patients admitted that they were relieved of unbearable misery but later on would not put up with the state of affairs and implored us to close the opening. They were all women, or rather two women and a young girl. A man is perhaps a little less sensitive, but a woman cannot be happy unless she is clean and attractive. The result of closing the ileostomy in two of the reported cases is therefore of interest even if they should only represent exceptional conditions. One had the ileostomy closed and was satisfied and reasonably comfortable for ten years afterward. The other who had her ileostomy closed a year ago is rather satisfied so far.

All surgeons appear to admit that ileostomy with exceedingly few exceptions leaves a lamentable state of affairs. It is best done in the most simple manner through a grid-iron incision. R. H. Miller in the above mentioned discussion of McKittrick's paper lays

stress on this point, and he warns against exploration. Much handling of the gut is to be avoided as it may set up a general peritonitis. He compares the condition of the gut wall with that of a canvas tent in a rain storm. It remains dry inside until you draw a finger along it, when it starts to drip. In one of our cases we mentioned that getting hold of the gut caused hemorrhagic suffusion. The intestine, therefore, has to be handled with utmost care.

In looking for an improvement of the condition following ileostomy it appeared to me one could lead the gut on a slant through the rectus muscle. This would create some sort of a sphincter. In addition there would be less of a tendency toward an eversion of the gut which happens not infrequently. A catheter might be used for evacuation.

If the ileostomy is done in such a manner that it can be closed later on rather easily, the decision to have such an artificial opening established at least temporarily is made easier for the patient.

Colectomy remains as the final trump card which the surgeon holds. While it is not as formidable an operation as it might appear, the preservation of the normal rectal sphincter would be of great value where the case allows it, and under such circumstances a trial like in Case 4 with or without a colectomy later on seems permissible.

The course of the disease with its remissions over long periods of time, and the very harmful influence of mental upsets make one hesitate in accepting the condition as a straight infectious process. Fear, wrath, and similar excitement act strongly on the autonomic nervous system. Adrenin is poured out, not only by stimulation of the adrenals, but the ends of the sympathetic fibres create locally adrenin on stimulation. Daily observation tells us that in an infected tissue the nerves are abnormally sensitive to stimulation. Inasmuch as even in a normal individual severe peristaltic contraction of the colon may be observed in sudden fear, the spasms of an infected gut in an individual with a very labile mental equilibrium would naturally be much increased. And now another factor enters: in thrombo-ulcerative colitis the infection reaches deeply into the gut wall. While rest is the paramount requisite for inflamed tissues to heal by not interfering with Nature's repair work, we can readily recognize the deleterious effect of spasms. The statement of our last mentioned patient that acute aggravations could invariably be traced to mental upsets is significant. And still another factor is to be considered. Physiologists have shown that adrenin is only one of the substances produced by nerve stimulation. Deeper changes in the chemism of the parenchymatous organs through nerve influence may have to be reckoned with. This would be in harmony with the good results by parenteral liver therapy as reported recently by G. Cheney.[3]

Even this, our very small experience, demonstrates the great variation in individual patients. Though they were all surgical cases, the hope for the future must lie in the medical treatment, which with serum and vaccine and especially neoprontosil has produced noteworthy results and for this reason ought to be tried before resorting to surgery in all but the most violent acute upsets.

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Discussion

ALBERT M. SNELL, Rochester: It is always a pleasure to hear Dr. Schwyzer recount his experiences and his remarks tonight are of particular interest to those who have had any experience in the treatment of ulcerative colitis.

There are one or two recent points in treatment which can be mentioned. The first has to do with the nutritional aspects of the disease. It has been noted for a long time that deficiency states of one type or another are not uncommon complications in advanced ulcerative colitis. It is believed generally that these are due to faulty absorption of vitamins from the intestinal tract. In some cases it is apparent that the defect in absorption may be considerable, since patients may present themselves with pellagra, peripheral neuritis or marked deficiency in prothrombin. Mackie reported that 63 per cent of the patients with ulcerative colitis who were under his care at the Roosevelt Hospital had nutritional disturbances of some type. It is now considered good practice to use generous supplies of the vitamin B complex and other vitamins in treatment of the disease; some rather encouraging results have been noted.

The use of derivatives of sulfanilamide in treatment of the condition is still being investigated. As is generally known, fatty metamorphosis of the liver may develop in cases of ulcerative colitis; hence, such patients may be vulnerable to the hepatotoxic effect of some of these drugs. I have seen one or two instances of subacute atrophy of the liver following their use. A new compound, sulfaguanidine, appears to be of some promise for it is less toxic and absorbed more slowly than some of the compounds of sulfanilamide now in general use. However, our experience with sulfaguanidine has been limited.

DR. ALFRED HOFF, Saint Paul: I was very much interested in this paper and in Dr. Snell's discussion. I have followed one case for twenty-one years, which I think is worthy of presentation at this time. My first contact with the patient was in 1919 when she was suffering with an acute fulminant ulcerative colitis. She remained in the hospital four months; her temperature ranging from 102° to 104°, with frequent stools containing mucus, blood and pus. She became marasmic, losing about 50 pounds in weight, and was confined to bed for a total of six months. She gradually recovered her weight loss and, except for some abdominal discomfort, remained well for a period of ten years, when she relapsed and again went through the same severe infection with a course almost identical with that of the first attack. It had the same long duration and severe symptoms.

I saw her last week—twenty-one years later. She now weighs 133 pounds and says that, except for occasional abdominal cramps with slight diarrhea, she is in good condition. A proctoscopic examination in 1934 showed no ulcerations and the rectal folds were not indurated. A barium enema at that time revealed an absence of haustrations involving the colon generally with constriction of the lumen of the bowel in the pelvic colon.

Another case of interest is an autopsy proven case

of chronic ulcerative colitis in a man sixty-nine years of age. It was associated with a severe depression of the bone marrow, showing a marked anemia and a progressively more profound leucopenia involving especially the granulocytic series. No immaturity of cells was noted and a postmortem bone marrow study at Dr. Downey's laboratory revealed a severe leucopenia in the marrow with invasion of lymphocytes while the neutrophils in toto amounted to only 8.5 per cent of the total number of cells. The bone marrow, therefore, was regarded as not completely agranulocytic. During a period of six weeks' observation with repeated blood studies, his hemoglobin averaged 52 per cent, the high 68 per cent and the low 37 per cent shortly before death. The average of seven erythrocyte counts was 3,000,000. The leukocytes on admission to the hospital numbered 1,600 with 38 per cent neutrophils, 49 per cent lymphocytes, 10 per cent monocytes, 2 per cent eosinophils and 1 per cent basophils. During the following six weeks, they progressively fell lower until the day before his death his leukocytes numbered 130 cells with 36 per cent neutrophils and 64 per cent lymphocytes. No immaturity was found. Terminally, he developed a severe membranous sore throat with chills and high fever, so often seen in blood dyscrasias.

In view of his blood findings, one is hardly justified in considering this to be a case of true agranulocytosis. No history of any medication was present. An effort was made to stimulate his bone marrow function with the use of liver extract and pentnucleotide.

Of interest also is the fact that this patient was a bachelor living alone on a small farm, where, for a considerable period of time, his diet had been very inadequate.

DR. JAMES JOHNSON, Minneapolis: There are two questions I would like to ask Dr. Schwyzer, who has had vast experience along this line:

1. Does he not feel that once an ulcerative colitis, always an ulcerative colitis?
2. Does he believe there is any one thing that causes ulcerative colitis; or, at least when we meet these cases, isn't there a great multiplicity of causes responsible for the continuation of the condition?

I have had patients get well on Bargen's vaccine, tomatoes, peanuts and sunshine. For example, I have placed them on restricted diets and they have constantly become worse; and then, in desperation, they would go ahead and eat everything they wanted and get well. There is, no doubt, a variety of causes, perhaps largely on a deficiency basis.

DR. ARNOLD SCHWYZER (in closing): First, to answer the question of—once a colitis always colitis. That theory was proclaimed vividly by Dr. D. F. Jones at the mentioned meeting of the American Surgical Association. In his opinion, there would always be a colectomy in the end if the patient did not die beforehand.

In the paper I reported the two cases, one well for sixteen years and the other ten years; well surgically, but not anatomically. Some cases improve but you cannot foresee the course. There is always the question whether the improved ones had the same condition as the others. Bargen has given this subject a very great amount of attention, and he had such a large percentage of good effects from serum and vaccine that this fact remains of outstanding importance.

In the one case I mentioned, the woman had been in bed for a whole year with terrible misery and then, after vaccine, serum and neoprontosil, in three weeks feels well and never feels she needs further attention.

The fifth one of my cases well demonstrates the nervous influence. Every time she has an upset, it is due to some psychic irritation.

Under such conditions, the autonomic nervous system is especially much worked up. We know that from the very ends of the activated motor nerves there is a formation of adrenalin. As the nerves of the muscular coat of the gut are irritated by the inflammation, there is going to be more and worse spasms, and spasms are the worst thing for the healing of the infection. To have healing, there ought to be rest; so in these cases we have a vicious circle. We have to figure also with an effect on parenchymatous organs as well by nerve action as purely chemically from toxic products.

As I mentioned in the paper, Cheney reports very good results from parenteral administration of liver extract. The causative micro-organisms may be different in different patients and each case thus remains a problem of its own.

THE TREATMENT OF ACUTE CORONARY OCCLUSION BY LONG CONTINUED USE OF OXYGEN THERAPY

An Experiment

C. N. HENSEL, M.D., F.A.C.P.

Saint Paul, Minnesota

For years the only remedies for the treatment of acute coronary thrombosis were bed rest and morphine. Occasionally a case was encountered in which morphine did not relieve pain, or in which the circulation seemed to fail; then oxygen by means of the oxygen tent was supplied, often with beneficial results on both pain and circulatory support.

In December, 1938, Dr. Walter Boothby demonstrated before the Minnesota Society of Internal Medicine his B. L. B. mask for giving 100 per cent oxygen. It was shown that oxygen by this method was much less expensive, easier to apply, better tolerated than the tent, and above all, that it delivered approximately 100 per cent oxygen to the trachea, whereas the oxygen content of the tent, at best, was only 60 per cent.

Boothby further demonstrated that by this method of giving 100 per cent oxygen, the arterial blood would contain 10 to 15 per cent more oxygen. The amount of supersaturation would depend on the level of the hemoglobin and on the rate of the circulation.

He stated that under normal conditions, as the blood passes through the capillaries, the rate of circulation is so regulated that it gives up about one-third of its oxygen to the tissues and enters the veins about 60 per cent saturated, at which degree of saturation the partial pressure of oxygen in the capillaries would be approximately 35 mm. of mercury. When the rate of circulation is decreased, the blood may give up nearly 80 per cent of its oxygen as it passes through the capillaries; therefore the venous blood is only 20 per cent saturated and exerts a partial pressure of oxygen of only 14 mm.

This lowered capillary tension probably reduces capillary tone, favors capillary dilatation, and increases circulatory stasis. In most cases of acute coronary thrombosis, there exists in addition to pain, a marked drop in blood pressure and signs of shock.

Because of the above factors oxygen therapy is indicated in the treatment of acute coronary thrombosis and has been used successfully during the past two years

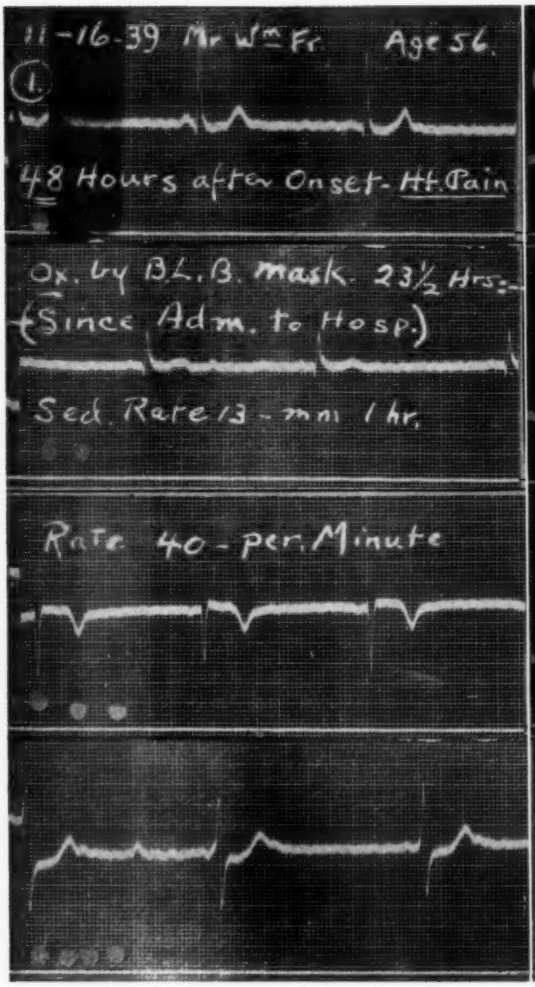

11-16-39 Mr Wm Fr Age 56
1
48 Hours after Onset Ht. Pain
Ox. by B.L.B. mask 23½ Hrs:-
(Since Adm. to Hosp.)
Sed. Rate 13 - mm 1 hr.
Rate 40 - per Minute

Fig. 1. Electrocardiogram taken forty-eight hours after onset of heart pain shows a rate of forty beats per minute, and a slurring take-off of the T wave in leads 1 and 2, and a flattened T wave in lead 2 and crescentric downward deflection of the T wave in lead 3.

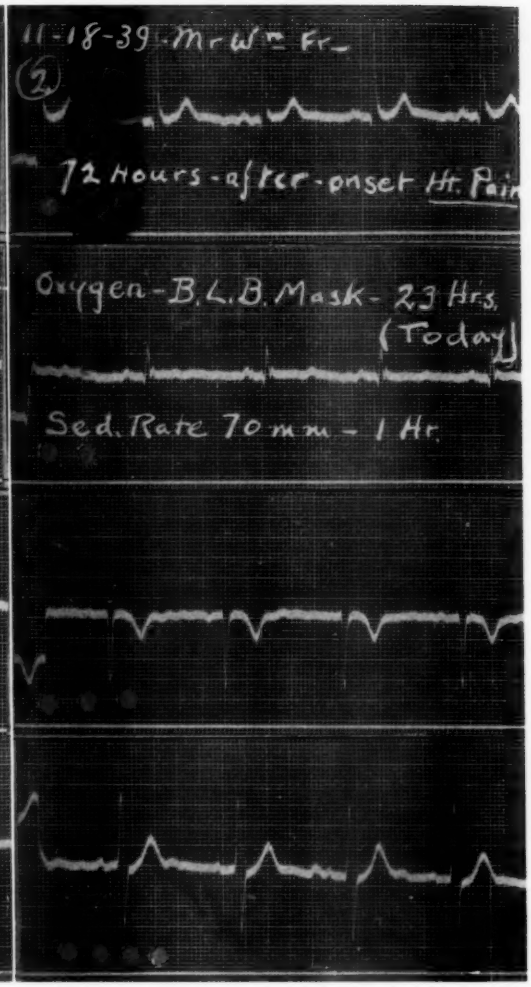


Fig. 2. Electrocardiogram taken seventy-two hours after onset of pain shows a rate of sixty beats per minute and a rising in the take-off of the T wave in leads 1 and 2, and an increase in the slurring in lead 2. T_2 is now iso-electric and the downward descent of T_3 has increased.

by the B. L. B. mask. Its use has usually been discontinued at the end of twelve to twenty-four or forty-eight hours, when the signs of shock had abated and pain had disappeared. However, I encountered a case of acute coronary thrombosis in a man, who, because of pain and marked cyanosis, needed to have the oxygen therapy by the B. L. B. mask pretty continuously for fourteen days, before his cyanosis could be controlled.

From then until the twenty-eighth day oxygen therapy was continued on theoretical grounds in gradually decreasing amounts.

Case History

The patient, Wm. Fr., aged fifty-five, a wholesale meat dealer, was admitted to the Miller Hospital by ambulance at 3 p.m., November 15, 1939, suffering from substernal pain radiating to the shoulders and arms of twenty-four hours' duration.

History of Complaint.—A business executive, under great strain for the previous ten years, and while apparently in good health and strong (often shouldered 200 pounds of beef easily) left an exciting Downtown Quarterback's luncheon meeting and walked five blocks to his parked automobile. During his post-prandial walk he experienced severe substernal pain but after a ten-minute rest was sufficiently relieved so that he made calls on his trade during the afternoon. He returned to his home complaining of a dull ache beneath the sternum and spent a restless night because of this substernal ache.

He worked till noon of the next day, but returned home because of the pain and called the family physi-

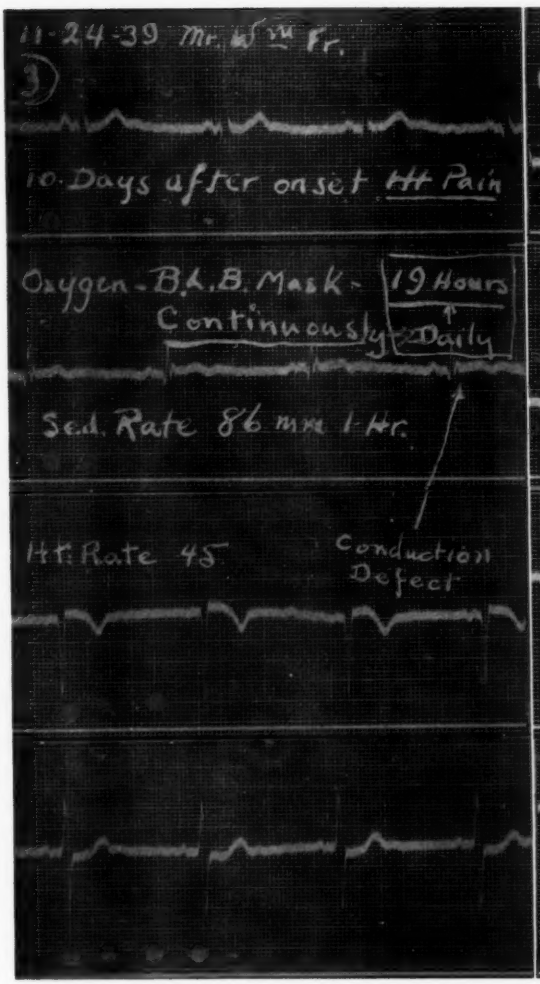

11-24-39 Mr. W. Fr.
3
10 Days after onset Htt Pain
Oxygen - B.L.B. Mask - 19 Hours
Continuously - Daily
Sed. Rate 86 mm 1 Hr.
Htt. Rate 45
Conduction Defect

Fig. 3. Electrocardiogram taken ten days after onset of heart pain shows a heart rate of forty-five beats per minute, and an increase in signs of slurring of take-off of T_2, and a beginning downward descent of T_2.

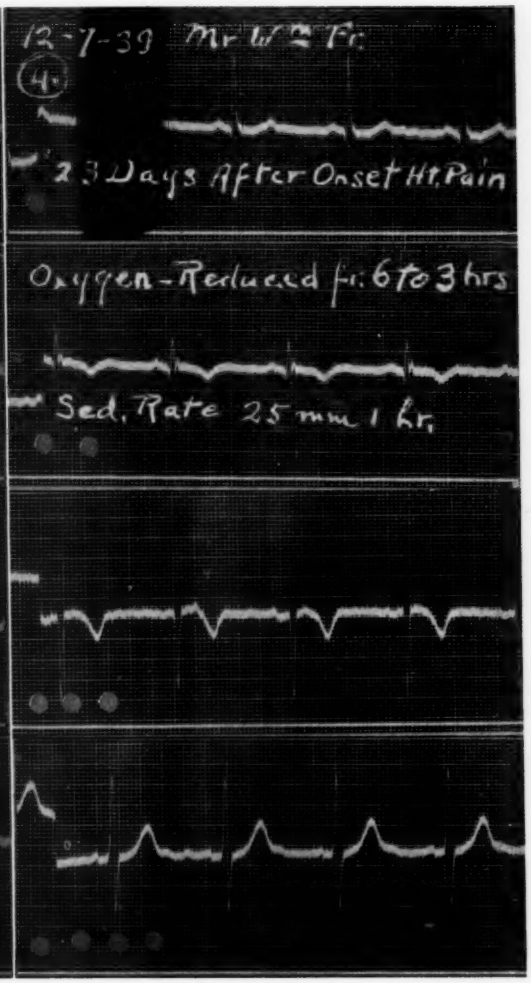


Fig. 4. Electrocardiogram taken twenty-three days after onset of pain shows a heart rate of sixty beats per minute, a flattening in the contour of T_1, and a further inversion in T_2. In lead 2 the T wave shows a crescentric downward deflection. The change in the contour of 2 and 3 is suggestive of an involvement of the branch of the right coronary artery.

cian. He was seen at home by the family physician about 2 p.m. (twenty-six hours after onset of pain) with a heart rate of 90 and a blood pressure reading of 160/90, and was sent to the hospital with a diagnosis of probable coronary occlusion.

When first seen by me the patient was in a state of profound shock. There was an ashy grey pallor in his face, combined with a deep cyanosis of the lips, cheeks, and ears. His heart rate was 30 beats per minute, the rhythm was regular, the tones were faint and distant in character. No murmurs were elicited, and there were no congestive rales in the lungs or passive congestion of the liver. From the patient's facies and general condition, death appeared imminent. Blood pressure 94/54.

Treatment.—Continuous oxygen therapy (100 per cent) by the B. L. B. mask was started, and morphine and glucose were given. Diet was limited to 500 calories a day.

Diagnosis.—Slow coronary occlusion with heart block; condition critical.

Course.—Within one-half hour after giving morphine, gr. ¼, by hypodermic, and applying oxygen, the pain was reduced in severity, and the patient appeared to be resting comfortably. At the end of three hours of 100 per cent oxygen therapy by the B. L. B. mask, the state of marked cyanosis and shock was improved, the pulse rate was recorded at 60 beats per minute, and the blood pressure at 145/85. During the night the pulse rate varied from 60 to 42 beats per minute.

The second day in the hospital and forty-eight hours after onset of substernal pain, the patient's condition was still critical. The heart rate was 44, rhythm regular, tones faint and distant. Blood pressure 115/85. When the mask was removed ten minutes for light breakfast, the substernal pain reappeared, and later when the mask was removed while an E.K.G. was taken the pain again reappeared. The patient was

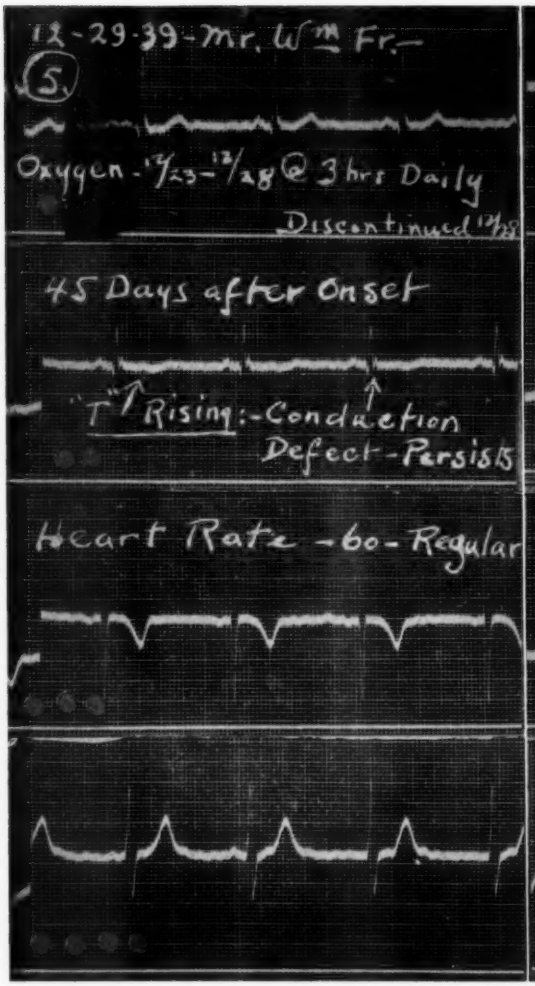


Fig. 5. Electrocardiogram taken six weeks after onset of heart pain shows a heart rate of sixty-two beats per minute, a persistance of the conduction defect in leads 1 and 2, but a rising of the T_2 to a nearly iso-electric position.

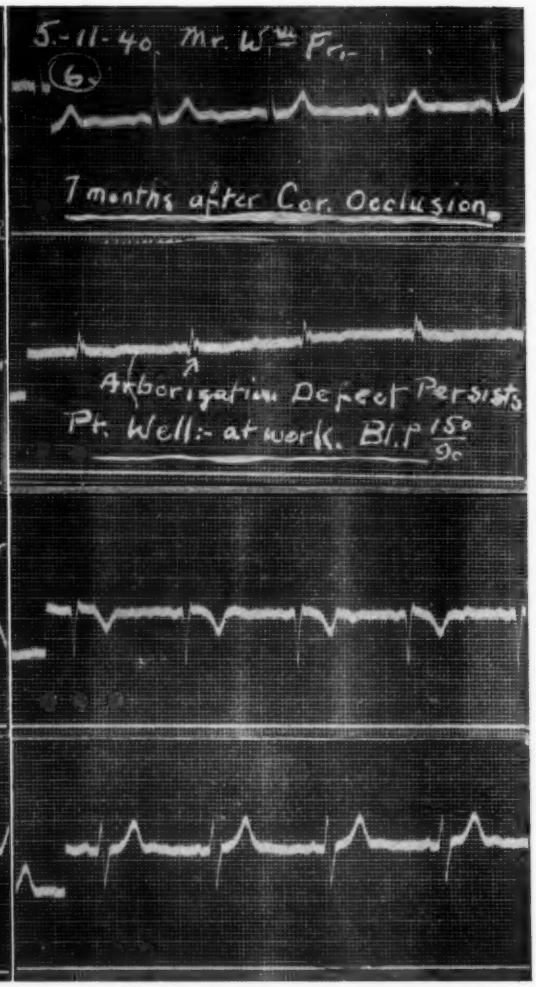


Fig. 6. Electrocardiogram taken seven months after onset of heart pain resulting from coronary occlusion. Shows a heart rate of sixty-two beats per minute and a regular rhythm. PR interval is .16 seconds, QRS .08 seconds, and RT .44 seconds. The T_1 is of normal contour and good height, and the take-off is returned to the normal position with only a minimal amount of slurring in evidence. In lead 2, QRS shows a marked stunting and notching in the descending limb, characteristic of aborization defect. The T_2 is flat in contour and diphasic in outline. The T wave in lead 3 still shows crescentric downward deflection. This record shows that there has been involvement both of the right ventricular wall and the interventricular septum.

without a mask but a half hour of the second twenty-four hours of his illness.

Sedimentation rate was 13 mm. at the end of 1 hour. Hemoglobin 15.6 gm. (93 per cent). Leukocytes 11,800.

On the third day in hospital, the mask was off a total of 1.5 hours and pain and cyanosis returned.

On the fourth day in hospital the patient complained of tightness and pain around the heart. A coarse pericardial friction rub was clearly audible. Sedimentation rate was 70 mm. at the end of 1 hour. Temperature 101° (rectal).

On the fifth day in the hospital the friction rub over the pericardium was absent. The oxygen mask was off 20 minutes four times this day but cyanosis was marked when the mask was off.

On the seventh day in hospital when the oxygen mask was off for thirty minutes, there was no dyspnea, no reduction in pulse volume, and no change in color. The pulse rate was forty-eight beats per minute, respirations twenty per minute. When the oxygen mask was off for forty consecutive minutes, the lips gradually darkened to cyanosis. The oxygen mask was off for a total of ninety-five minutes.

On the eighth day in the hospital, the oxygen mask was off for three periods of forty minutes each, a total of 120 minutes. Slight periodic pain in the cardiac region, slight cyanosis was present when the mask was off.

On the ninth day in the hospital, the oxygen mask was off for five periods varying from fifteen to sixty minutes. No heart pain occurred, and no cyanosis developed. The total time the mask was off was three hours, twenty minutes.

CHART I. GRAPH SHOWING THE HOURS OF OXYGEN ADMINISTRATION DAILY

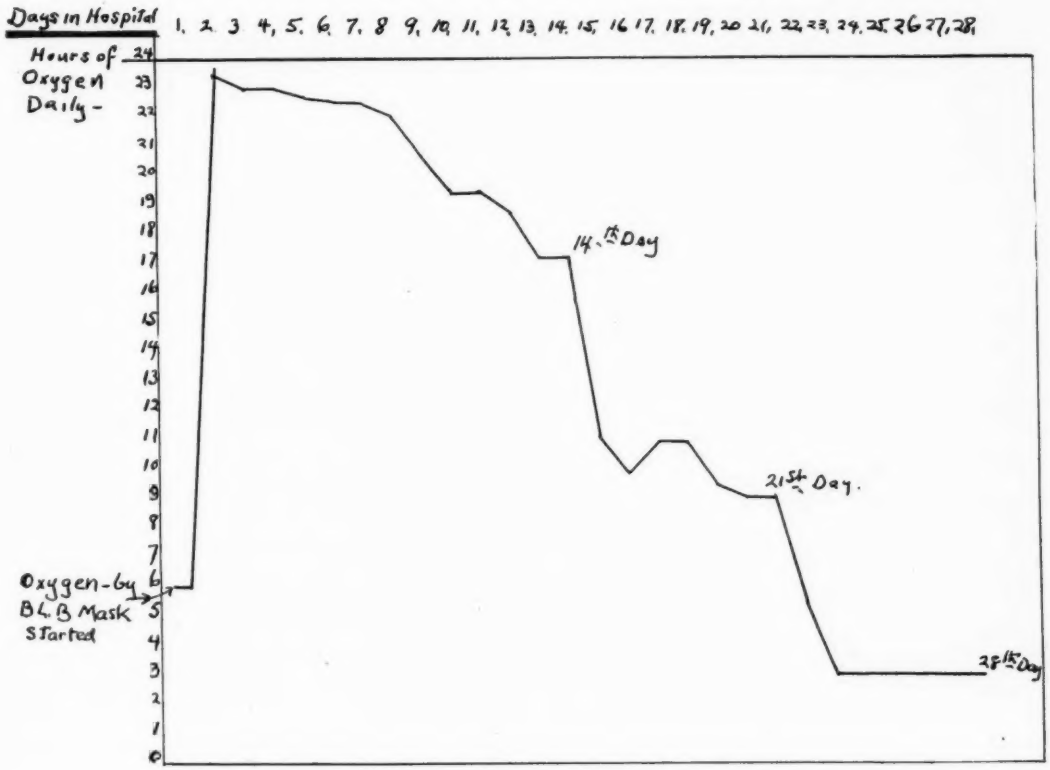
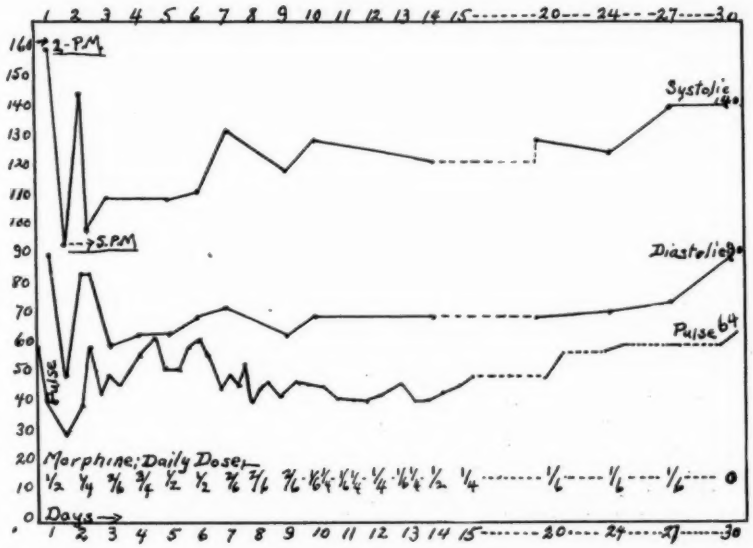


CHART II. COURSE OF BLOOD PRESSURE AND PULSE THROUGHOUT THIRTY DAYS OF SICKNESS



On the tenth day in the hospital, when the oxygen mask was off one and one half hours, the lips became cyanotic towards the end of the time, but no dyspnea developed. There was no change in pulse rate or volume. The total time the mask was off was four and a half hours at intervals of from one half to one and one half hours.

The quantity of food allowed daily was gradually raised to 1200 calories in the past few days.

On the fourteenth day in the hospital, the total time the oxygen mask was off was six hours and fifty minutes at intervals from one half hour up to three hours. Cyanosis was absent all day and in its place there appeared a "ruddy" color to the face similar to that in polycythemia vera. Pulse was fifty-two beats per minute, rhythm regular, and blood pressure 122/70.

TABLE I. SEDIMENTATION RATE

(Note marked early increase and later decrease)

Date	Sedimentation Rate Per Hour	
11-16-39	13 mm	2nd day
11-18-39	70 mm	4th day
11-23-39	86 mm	9th day
12- 2-39	50 mm	17th day
12-13-39	25 mm	28th day

Comment

To one watching this patient as closely as I did, the value of continuous 100 per cent oxygen therapy by the B. L. B. mask seemed without question a probable life-saving measure, during the first few days.

The relative bradycardia with a resultant slowed circulation rate, probably made heavy drafts on the oxygen content of the circulating blood, resulting in marked cyanosis.

I reasoned that if the capillaries in the cheeks show cyanosis, then the capillaries in the heart muscle must also show cyanosis (registering tissue anoxemia), and as long as this condition existed, a supplemental supply of oxygen was necessary and should be given.

I was aware of Dr. Boothby's caution in his article on "Oxygen Therapy" in the July, 1939, issue of *Medical Clinics of North America; i.e.,* "until further experiments have been carried out, it is inadvisable to administer pure oxygen for longer than two days." But in this particular case I had no alternative but to continue oxygen therapy as long as cyanosis persisted.

The only objectionable symptoms which arose during the long period of continuous oxygen therapy were motor restlessness during sleep, a tendency to wakefulness, mental excitability, and talkativeness during the night. These symptoms were promptly reduced and often controlled by moderate doses of morphine hypodermically. While under the oxygen mask through the day, the patient often complained of a disagreeable sense of warmth in the skin.

On the favorable side there was the apparent effect of the oxygen therapy on the intestinal tract. After the sixth day the abdominal distension disappeared, the walls became soft and pliable, the patient passed flatus freely and soon began to have daily, spontaneous, easily expelled bowel movements.

Finally it seemed reasonable to believe that such oxygen therapy could not have been harmful, when a patient who had been so critically ill at the beginning of treatment could look so splendidly well at the end of fourteen days of such therapy. However, because of the above mentioned objectionable symptoms, it was decided now to withdraw the supplemental oxygen therapy cautiously, not knowing how the human organism would react during quick withdrawal. Therefore the time the oxygen mask was off was gradually increased from six to twelve hours without any deleterious effect.

Now, instead of dispensing with oxygen therapy as quickly as possible (since cyanosis was no longer present), it was decided to continue oxygen therapy on theoretical grounds, for as many hours a day (up to twelve hours) as the patient would tolerate it.

Since the process of healing of cardiac infarcts, following coronary artery occlusion, is characterized during the first few days by a liquefaction necrosis of the muscle fibres, followed by the ingrowth of connective tissue fibres and new blood vessels, I reasoned that a supplemental supply of oxygen should facilitate tissue repair and possibly reduce the amount of muscle necrosis.

Therefore, since the patient had become well trained in the use of the oxygen mask and was exceedingly cooperative, I explained my theories to him and asked him to aid me in this experiment. This he consented to do.

The patient took oxygen by the B. L. B. mask for the next seven days, namely, up to the twenty-first day of his illness, in decreasing daily amounts, from eleven to ten to nine hours. It gradually became apparent that, since the disappearance of the cyanosis, the patient did not tolerate oxygen therapy as readily as he had done previously. He complained of a disagreeable sense of bodily warmth when the mask was on and desired extra coolness and ventilation in his room. Some of these complaints seemed to be nervous because when most of the oxygen was given at night and the patient received an injection of morphine sulphate, grains 1/6, by hypodermic, before the mask was applied, he got through the night fairly well and slept at long intervals.

By the twenty-first day it was felt that the necrotic process in the infarct was no longer going on, and that the connective tissue repair was in full swing, so that on theoretical grounds supplemental oxygen would no longer be necessary. So it was planned to wean the patient gradually from his supplemental oxygen supply.

For the next two days the hours under the B. L. B. mask were cut from nine to six hours without any untoward incident. For the next five days the hours under the mask were cut to three in each twenty-four-hour period. Oxygen was usually given for three hours each evening, always preceded by an injection of 1/6 grain of morphine sulphate by hypodermic.

By this arrangement the patient was freed from the annoyance caused by the long continued use of the mask and usually slept quietly for the ensuing three hours.

On the twenty-eighth day of his illness, all oxygen therapy was terminated without any apparent deleterious effect. With the stopping of the oxygen the daily hypo-

dermic injection of 1/6 grain of morphine sulphate was also stopped. Following the stopping of the morphine no craving for the drug or "withdrawal symptoms" appeared. The patient did not receive or appear to need any more morphine.

Patient's Condition at End of Four Weeks

Four weeks after the onset of an attack of acute coronary artery occlusion, treated by flat bed rest and continuous oxygen therapy by the B. L. B. mask, the patient appeared to be in good physical condition. The color of his cheeks had been "ruddy" from the fourteenth day on. His blood pressure was 140/74; heart rate was between 54 to 60 beats per minute, rhythm regular. The apical first tone which was formerly muffled and distant in character had increased in force and definition. The walls of the belly were soft and pliable and patient had had one to two soft, spontaneous stools daily since the end of the first week. Such a relaxed belly, freedom from gaseous distension and spontaneous stools may be attributed to the use of oxygen.

At this time the examination of his blood revealed a hemoglobin of 16.8 gms. (101 per cent), an erythrocyte count of 5,950,000, and a leukocyte count of 13,050, the blood picture of a mild polycythema vera.

That the oxygen therapy did not produce this blood condition is probable from the fact that his hemoglobin on admission was high, 15.6 gm. (93 per cent) and also from the fact that his wife reported that a "ruddy" complexion was his customary appearance.

For the balance of his course the patient received the usual orthodox treatment of graduated sitting up and graduated walking. He was transported to his home by ambulance on the forty-ninth day of his illness, where he continued his schedule of slow rehabilitation.

At the end of three and a half months from the onset of his illness, he appeared to be pretty completely restored to his usual health. The patient was last seen July 22, 1940, at which time he appeared to be well. He stated that he worked every day and experienced no heart pain, dyspnea, swelling of the ankles, or undue fatigability. His blood pressure was 160/80, and his heart rate was sixty beats per minute; the rhythm was regular and no murmurs were elicited.

A paper by Drs. Mallory and White of Boston, on "The Speed of Healing of Myocardial Infarction" which appeared in the *American Heart Journal* for December, 1939, lends some credence to the theory on which the long continued use of oxygen therapy was applied in this case. They studied the hearts of seventy-two human patients who showed a myocardial infarct at autopsy, such cases having been thoroughly studied before death. In practically all of these cases there was a moderate to a marked degree of generalized athero-sclerosis of the coronary arteries in addition to that in the occluded branch. Thrombi were found in 70 per cent of the cases.

They observed that the first results of stoppage of blood supply to a portion of the myocardium was a necrosis of muscle fibres, and to a lesser degree, of the connective tissue fibres and blood vessels. These signs were first recognizable as early as five to six hours after stoppage.

They found that usually there was a thin layer of surviving tissue 0.3 to 0.5 mm. in thickness along the endocardial surface, the infarcts usually occurring in the middle of the ventricular musculature. Polymorphoneuclears were seen to infiltrate quickly the infarcted area. The purpose of their presence was not clear, but it was believed that they produced an enzyme which aided in the breakdown and phagocytosis of muscle fibres.

By the end of the fourth day newly-formed blood capillaries and connective tissue cells were found growing into the infarcted area. By the end of the tenth day the ingrowth of newly formed connective tissue fibres and newly formed blood vessels had become quite marked. The process of this ingrowth started at the periphery and extended centrally. By the end of the second week the muscle fibres were almost completely removed from small infarcts (i.e. 3 to 4 mm. in diameter).

During the third week the removal of muscle fibres was still going on in large infarcts.

The first signs of collagen formation were found in the form of fine collagen fibres. These were first produced by fibroblasts at the periphery.

From the fourth to the sixth week the age of the infarct was largely dependent on the amount of collagen present, and therefore an actual dating was impossible. In conclusion they stated that the rate of healing depended upon the size of the infarct, its location, and the patency of the surrounding arteries. They observed that the rate of healing was slower where there was a diffuse coronary sclerosis (relative anoxemia C.N.H.) than if the other vessels were of normal calibre.

Summary and Conclusions

By this experimental study I have attempted to demonstrate that 100 per cent oxygen therapy can be tolerated by the human being for long hours daily, day after day, without any apparent harmful or deleterious effect, and that its use is valuable in relieving the pain of acute coronary occlusion and the accompanying state of shock and cyanosis.

I cannot, of course, know what, if any, beneficial effects such supplemental oxygen therapy had on the ultimate size of the infarct or on the acceleration of the healing.

According to the studies of Drs. Mallory and White, the ingrowth of new blood vessels appears early, i.e. the fourth day, and is quite marked by the tenth day. Certainly where tissue repair is going on so actively, an abundant supply of oxygen should aid such tissue repair.

The use of 100 per cent oxygen certainly did not harm this patient, and the evidence probably suggests that death was prevented and the healing was accelerated. Certainly the patient was more comfortable as the result of relief of pain and relief from the secondary ill-effects of anoxemia.

Supplemental Notes

Since the presentation of this paper, I have had the opportunity of reviewing studies of Dr. Clark and his associates (*Anatomical Record,* Vol. 50, 1931, page 129) on "The Rate of Ingrowth of New Blood Vessels into Standardized, Transparent Chambers Placed in the Living Rabbit's Ear." Their observations on the rate of ingrowth of new vessels parallels to a remarkable degree the rate of ingrowth of new vessels as observed by Drs. Mallory and White in their study of "The Speed of Healing of Cardiac Infarctions." Therefore it seems that a brief abstract of Dr. Clark's work should be included here.

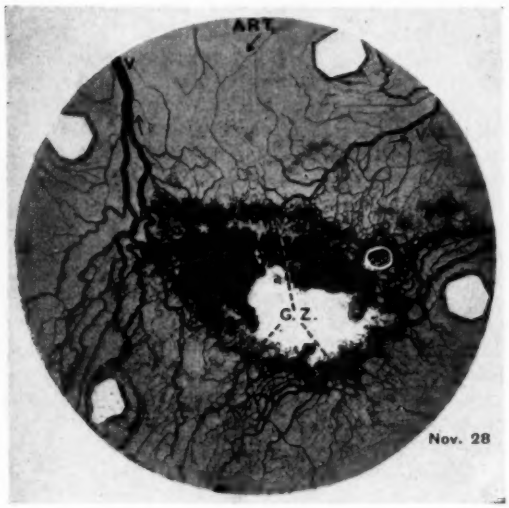


Fig. A. Photomicrograph of the transparent chamber in a living rabbit's ear taken fifteen days after installation and ten days after appearance of new capillaries at the periphery. (From Clark and Clark, Am. Jour. Anat., 55:410, 1934.)

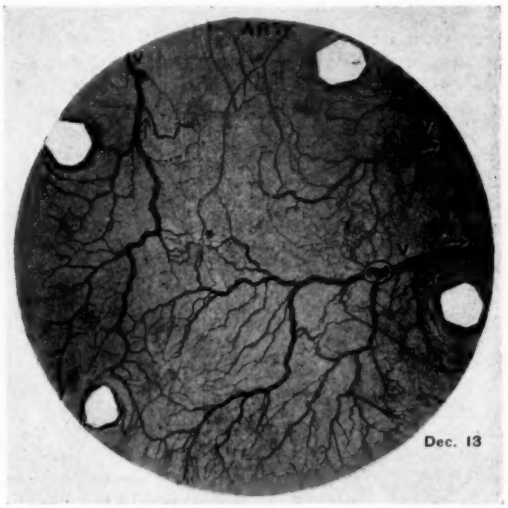


Fig. B. Photomicrograph of the same area as shown in Figure A taken one month after the installation of the transparent chamber. The area is completely vascularized and the vessel pattern has become stable. (From Clark and Clark, Am. Jour. Anat., 55:411, 1934.)

The chambers were so placed in the rabbit's ear that there was a vacant space between the upper and lower tables varying in depth from 40-75 mu. Their observations were based on the placement of sixty standardized chambers and in many instances these chambers were studied daily, and in some instances their observations continued over a period of a year.

They observed that shortly after the installation of the window the vacant space between the tables was filled by blood serum, fibrin, erythrocytes, and leukocytes. Into this amorphous mass new capillaries were first seen to appear at the edge of the chamber between the fifth and ninth days after the installation in some instances, but in the majority the ingrowth of vessels began on the seventh day. These new vessels appeared to arise from pre-existing blood vessels outside the chamber by means of endothelial sprouts which quickly anastomosed to form loops.

The process of sprouting and loop formation continued (Fig. A) until the advancing networks from opposite sides were seen to coalesce, and now the whole space in the transparent window was covered by a vascular plexus (Fig. B). While this advance in the capillary plexus was going on, those vessels at the edge of the chamber which had first appeared, were seen to undergo a differentiation, gradually changing from capillaries into arterioles and venules.

The length of time required for complete vascularization of the window in the rabbit's ear varied in a few instances from sixteen to thirty-five days, but in the majority of cases studied, the vascularization was completed on an average for the entire series, of twenty-three days.

The authors observed that the manner in which new blood vessels grow into the transparent window in the living rabbit's ear corresponds in all essentials to the process of early growth of blood vessels in the embryo, as was shown by the injection studies of Evans ('09) as well as by the studies of Clark ('18) on "The Growth of Living Capillaries in Amphibian Larvæ."

Discussion

Dr. J. A. Lepak, Saint Paul: I think Dr. Hensel should be congratulated on his excellent result. I have used oxygen, like others treating heart disease, for coronary thrombosis. And, as Dr. Hensel recited the findings in his case, I recalled a case in which oxygen therapy was employed for about four weeks. Since the patient objected most strenuously to the mask, the tent was used.

Briefly, in the Spring of 1937 he had an attack of coronary thrombosis. After six weeks he left the hospital and several weeks later he returned to work. In October, 1937, he underwent an operation for an acute empyema of the gallbladder. On the 10th day after the operation, he developed pulmonary embolism involving a large part of the right lower lobe. In three or four months he was quite well again until the fall of 1939 when he had another coronary occlusion, so severe that he went into shock and developed an acute

bilateral hydrothorax. The fluid from the left pleural cavity disappeared shortly, but from the right side it had to be aspirated every seven to ten days for sixteen times for the relief of dyspnea and pain. During this three-month stay in the hospital, it was necessary to give him oxygen most freely. For the first four or five weeks, I do not know of anything that might have given him more relief, especially for pain. Today he is up and about, free of pain, but not free from some fluid in the right pleural cavity.

Recently consulting the Mayo Clinic, he was informed that the fluid in his chest was secondary to his cardiac condition. Despite all measures to eliminate it, it recurs.

This case, however, showed me very forcibly what oxygen can do, and I have no hesitation in commending its use in concentrated dosage over a long period in coronary thrombosis.

The meeting adjourned.

A. G. SCHULZE, M.D.,
Secretary.

The examination of familial contacts of tuberculin-positive children between the ages of six months and six years, may be a valuable case-finding procedure, since the opportunity for tuberculous infection among very young children is limited to the immediate family circle. PAUL PHELPS, M.D., et al., *Jour. Pediatrics,* Oct., 1940.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

HUGH YOUNG—A Surgeon's Autobiography. 554 pages. Illus. Price, $5.00, cloth. New York: Harcourt, Brace & Co., 1940.

FOREIGN BODIES LEFT IN THE ABDOMEN. The Surgical Problems—The Legal Problems. Harry Sturgeon Crossen, M.D., School of Medicine, Washington Univ., and David Frederic Crossen, LL.B., School of Law, Washington University, St. Louis, Missouri. 762 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1940.

METHODS OF TREATMENT. Logan Clendening, M.D., Clinical Professor of Medicine, Medical Department of the University of Kansas; Attending Physician, University of Kansas Hospitals; and Edward H. Hashinger, A.B., M.D., Clinical Professor of Medicine, Medical Department of University of Kansas; Attending Physician, University of Kansas Hospitals; Attending Physician, St. Luke's Hospital, Kansas City, Mo. 997 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1940.

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FEEDING THE PREMATURE BABY

(Continued from Page 34)

volume by boiling and adding 2 per cent of calcium caseinate (Casec) may have a beneficial effect.

Rectal temperatures should be discontinued with the first sign of diarrhea—the insertion of the thermometer seems to induce bowel movements. Axillary temperature must be resorted to.

Another complication common to prematures is anemia. They tend to develop a low hemoglobin very easily. A hemoglobin determination should be made no later than the fifth week of life, and if low should be repeated weekly. Some form of iron administration should be followed, beginning at the latest by the fifth week of life. Liver extract and/or ferric ammonium citrate with or without copper sulphate have given a very satisfactory response. The infant may receive each day one c.c. of a 10 per cent solution of ferri et ammonii citras for each pound, or 2 c.c. for each kilogram of body weight, and one-half per cent solution of cupri sulphas per pound or one c.c. per kilogram of the body weight. Both preparations are placed in the breast milk or in the feeding formula. The copper is discontinued after a short period of administration and is given for short periods in intervals. Clinical investigations are now in progress in order to determine a more effective method of combating the anemia of premature infants. These studies may lead to further modifications in the type of food and method of feeding of the baby born prematurely.

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